Vrije Universiteit Brussel

FACULTEIT WETENSCHAPPEN EN BIO-INGENIEURSWETENSCHAPPEN
Vakgroep Computerwetenschappen
Web & Information Systems Engineering Laboratory

An Ontology-based Sony Product Catalogue to Improve the Product Descriptions and the Customer Support

Proefschrift ingediend met het oog op het behalen van de graad van
Master of Science in de Ingenieurswetenschappen: Computerwetenschappen

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Academiejaar 2014–2015

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AUGUSTUS 2015

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Graduation thesis submitted in partial fulfillment of the requirements for the degree of
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Front Matter

"Don't judge a man until you have walked a mile in his boots." [see Man07, p. 62]
— Native American (Cherokee tribe) proverb

Samenvatting

In deze Master Thesis richten we ons op één specifieke business vraag: „Hoe gaan we op zoek naar compatibele componenten binnen een onderneming gebruik makend van ontologieën?" In deze context is „we" een kapstok voor zowel interne (onderneming) als externe (eind) gebruikers. We beantwoorden deze vraag binnen het domein van digitale fotografie, voor welke we een ontologie ontwikkeld hebben samen met onze partner Sony. Het bouwen van zo'n ontologie impliceert een grondige kennis van het domein. Daarvoor kijken we eerst naar de semantische annotaties op de websites van Sony, en hun belangrijkste concurrenten om een idee te krijgen van de omvang van het domein. Deze breedte analyse helpt ons om deze bestaande annotaties te integreren als een laag in de ontologie. Deze annotaties, i.e. eigenschappen, zijn echter niet specifiek voor een camera, maar ze vertegenwoordigen gemeenschappelijke kenmerken aanwezig in elk product. We voeren een beschrijvende statistische analyse uit over deze breedte analyse, waarin we aantonen dat de merken verscheidene annotatie schema's gebruiken. Sommige merken zoals Sony scoren hierin goed, terwijl er bij anderen zelfs geen basisondersteuning is. Ons werk kan door hen gebruikt worden als een gids om te kijken welke schema's het meest gebruikt worden binnen het digitale camera domein en welke ze zouden moeten ondersteunen. Daarna onderzoeken we de naamgevingsconventie binnen het domein en beschrijven alle mogelijke eigenschappen van camera's. Dit wordt door ons de diepte analyse genoemd en dit resulteert in de specifieke camera gerelateerde eigenschappen aanwezig in de ontologie. Indien de eigenschappen ook aanwezig waren in de demo dataset die door onze partner aangeleverd werd, werden ook de nodige cardinaliteiten toegevoegd aan de ontologie. Sony voorzag ons tevens van een algemeen intern classificatie schema dat zij graag wilden toevoegen aan onze ontologie als een business taxonomie. Dit schema verbindt ook ondersteunende bestanden aan het respectievelijke product, e.g. een stuurprogramma of handleiding. Alvorens we dit schema toevoegden aan de ontologie, maakten we een domein analyse om de verschillende business concepten van onze partner beter te begrijpen. Sony leverde ook echte demo data aan waarmee we onze ontologie konden testen. Deze data werd hoofdzakelijk aangeleverd onder de vorm van een Microsoft Access databank die echter eerst diende opgeschoond te worden. Daarna vertaalde we deze data naar triples die opgeslagen werden in een triplestore. We besluiten ons onderzoek met de ontwikkeling van een concept applicatie waarmee we aantonen dat onze ontologie, in samenwerking met de data uit de triplestore, kan redeneren over het compatibliliteitsvraagstuk. In deze applicatie tonen we voor een gegeven camera model, alle direct compatibele flashes, lenzen, baterijen en tripods. We demonstreren ook indirecte compatibiliteit voor lenzen gegeven een camera model. In ons domein wordt indirecte compatibiliteit gedefinieerd als compatibiliteit via een optionele adapter. In onze demo betekent dit dat lenzen compatibel zijn via een zogenoemde mount, i.e. lens, adapter. Tot slot becommentariëren we verscheidene problemen en beperkingen die we tegenkwamen gedurende ons werk. Hiervoor zochten we naar potentiele oplossingen die in overweging overweging werden genomen ten opzichte van een concrete implementatie van onze applicatie. We kijken ook naar toekomstige uitdagingen en mogelijke uitbreidingen.

Abstract

In this master's thesis, we focus on one specific business question: "How can we search for compatible components offered by a company using ontologies?" In this context, "we" is a porte-manteau for both internal (company) and external (end) users. We answer this question within the field of digital photography material, for which we have built an ontology together with our partner Sony. Building such an ontology implies a profound understanding of the domain. First of all we look at the semantic annotations on the websites of Sony, and their main competitors, in order to grasp the scope of the domain. This breadth analysis helps us to integrate these existing annotations as a layer into the ontology. In general, these annotations, i.e. properties, are not camera specific, but they represent general features present in every product. We perform a descriptive statistical analysis on this breadth analysis, where we show that the vendors use different annotation schemas. Some vendors like Sony perform well in annotating their data, while others lack even basic support. Our work can be used as a guideline by them to see which schemas are used the most frequent inside the digital camera domain and eventually which schemas they should implement. Next we investigate the naming conventions used by the various vendors in the domain, and we list all possible attributes. We call this the depth analysis, and this results in the specific camera related attributes present in the ontology. For the attributes present in the given dataset, we also encoded the required cardinalities, whenever possible.

Sony provided us with a general internal product classification schema which they want to add to our ontology as a business taxonomy. This schema links support files, e.g. a driver or manual, to the respective product. Before we can add the schema to the ontology, we make a domain analysis to better comprehend the business concepts used by our partner. Our partner also provided real world data that we used to populate and test this ontology. The core data is provided as a Microsoft Access database which needs to be cleaned and transformed into triples. These triples are then stored in a designated triplestore before they can be used together with the developed ontology. We conclude our research, by constructing a proof of concept application demonstrating that our ontology combined with the data stored in the triplestore is capable of reasoning over product compatibility. In this application we show, for a given camera model, all direct compatible flashes, lenses, batteries, and tripods. In addition, we also demonstrate indirect compatible lenses, given a camera model. In our context, indirect compatibility is defined as compatibility through an additional adapter. So, in our demo this means that lenses are compatible via a mount, i.e. lens, adapter. We discuss various issues and limitations that we encountered during our work, and we consider potential solutions for them. These issues are investigated with respect to a real world implementation of our application. Finally, we elaborate on future work and possible extensions.

Acknowledgement

The first person I would like to express my gratitude is prof. dr. Olga De Troyer for making it possible, under her supervision to realize my thesis. When reading my draft version, she provided me insightful thought, inspired me with useful remarks and ideas.

Many thanks to dr. ir. Christophe Debruyne, my advisor for his generous support during this master year. I also like to mention my co-students/ colleagues drs. ir. Sven Van Laere & ir. Dieter Van Thienen who were always available when I needed them.

Thanks to Sony Electronics Europe for giving me the opportunity to work on a real business problem. This work was conducted using the Protégé resource, which is supported by grant GM10331601 from the National Institute of General Medical Sciences of the United States National Institutes of Health.

I am particularly grateful to my aunt, Nelly Vandecauter, for reading and correcting my draft version. She always motivated me in moments when I felt down. To my mother for her patience and understanding although my father's dead. To my father who died unexpectedly on October 8, 2014. Pa thanks for your support, you gave me the opportunity and chance to fulfill my dream in studying. He would be very proud. Often I think of you and remember the happy moments we were together.

Lots of love,

Pieter Stroobants,

Thursday, August 27, 2015,
Oud-Heverlee, Belgium

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CHAPTER 1

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"We goan ne kere oanzetten."
I.e., let's get started, in Dutch dialect.

drs. ir. Sven Van Laere (⋆ 1989)

1.1 Problem Description

Our partner, Sony Electronics Europe, contacted us with a problem: Would it be possible to help with the automation of product compatibility? At present, each product must manually be coupled with all accessories and spare parts it is compatible with. This process puts a lot of strain on the personnel responsible for product monitoring, and the process is both error prone and time consuming.

Furthermore, whenever a product is added or removed, it is necessary to check the entire compatibility chain. In the 21st century, one would expect that this process can be automatized. In order to solve this problem, we first need to investigate how and where the product data is stored and look at possible inconsistencies within the data. At first glance, it becomes obvious that, within Sony Electronics Europe, the data is scattered over different databases and Extensible Markup Language (XML) files. We come back to this issue later on in this master's thesis. More information about the master's thesis and the code presented herein can be obtained at our website:

http://wilma.vub.ac.be/~pstrooba

1.2 Research Methodology

1.2.1 Introduction

During this master's thesis, we employ a methodology called *design science* [WH08; Wie09; Wie14]. From the standpoint of the Vrije Universiteit Brussel (VUB), we bring our knowledge of ontology design to the table, while Sony brings their knowledge about the domain to the project. The design science methodology helps all partners to work together during the development of the product by seeing design science as nested problem solving. Thus we can formulate our research in terms of problems that need to be solved one after another. Furthermore a distinction is made between practical & knowledge problems. Practical problems can be solved by the regulative cycle which we use to design, validate, implement, and evaluate our solution. This methodology helps each partner of the project to keep track of the work. To formulate their issues and concerns in a timely fashion, we provide a feedback moment at each end of an iteration of the cycle. This feedback can be the start of the next cycle. As the final step of each cycle mandates an evaluation, this is the ideal moment to communicate the results of that iteration among the partners.

1.2.2 Design Science

In *design science*, see Definitions 1.1 and 1.2, the connection between knowledge and practice is emphasized by showing that we can produce scientific knowledge by designing useful things.

Definition 1.1 (Design science according to Simon [Sim96, p. 114])

> Design science is concerned with devising artifacts to attain goals.

Definition 1.2 (Design science according to March and Smith [MS95, p. 253])

> Design science attempts to create things that serve human purposes.

Hevner *et al.* [HMPR04] devised a methodology from Definition 1.2 a methodological context for design science in which:

1. Business needs to motivate the development of validated artifacts that meet those needs.

2. The development of justified theories about these artifacts produces knowledge that can be added to the shared knowledge base of design scientists.

It becomes clear that design and research activities are closely related. However, we must make a clear distinction between *practical problems* (see Definition 1.3) and *knowledge problems* (see Definition 1.4), in order to avoid methodologically unsound research designs. In other words, *practical problems* call for a change of the world so that it better agrees with some stakeholder goals, while *knowledge problems* require a change in our knowledge about the world. Both kinds of problems are first class citizens in design science and they can both be equally challenging and rewarding to solve. The differences between both are also methodological. Answers to knowledge problems are *propositions* claimed to be true, while solutions to practical problems are changes in the world claimed to meet the goals for some stakeholders. Consequently, solving a practical problem involves investigating the goals of stakeholders, and evaluating solutions involves applying stakeholder criteria. Answering a knowledge problem involves applying stakeholder independent criteria of truth. Unfortunately these two kinds of problems are mutually nested in design science.

Definition 1.3 (Practical problem according to Wieringa [Wie09, p. 2])

A practical problem is a difference between the way the world is experienced by stakeholders and the way they would like it to be.

Definition 1.4 (Knowledge problem according to Wieringa [Wie09, p. 2])

A knowledge problem is a difference between current knowledge of stakeholders about the world and what they would like to know.

We see design science projects as problem solving projects. In practical problems there is someone who wants to change something in the world in the near or distant future. When we answer knowledge questions, we retrieve information about the world without changing it, except our understanding of it. Solving practical problems implies changing the world according to the wishes of the stakeholder, while solving knowledge problems means formulating propositions about the world [see Wie96, p. 52]. Different problem solving approaches also entail other evaluation criteria for the proposed solutions. Solutions to practical problems are evaluated by analyzing the problem, namely by identifying solution criteria often named *requirements* [GW89], based upon stakeholder goals. On the other hand, solutions for knowledge problems are checked by evaluating their truth value with respect to the subject domain of knowledge. Therefore, we will talk of *practical problems* and *knowledge questions* which have *solutions* and *answers*, respectively.

1.2.3 The Regulative Cycle

We generalize Definition 1.2 to include attempts where *existing* things may be improved to serve human purposes better. This will make a design science problem a practical problem. The structure of such a project becomes a *set of nested problems* [Wie09] in which the top level problem is always a practical problem. A logical structure for solving practical problems is the *regulative cycle* [vStr97; Wie96], shown in Figure 1.1.

This regulative cycle starts with an investigation of a practical problem, itself the outcome earlier iterations of the cycle. Next solution designs are formulated of which the outcome can be evaluated. Evaluations can then be the start of a new turn through the cycle. The regulative cycle is a general structure of a relational problem solving process [MH94; Sim55]. This means analyzing the current situation and goals, proposing possible changes to meet those goals, evaluating possible changes to

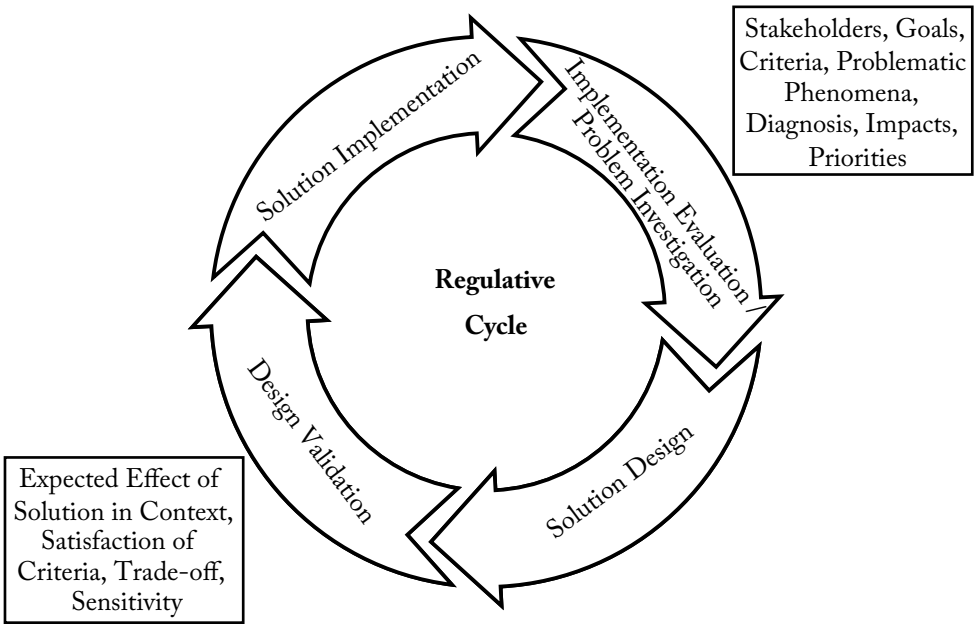

Figure 1.1: The Regulative Cycle.

select one which is applied and then start all over again. The cycle acts as our conceptual framework for the logic of practical problem solving. So can we decompose practical problems into practical & knowledge subproblems. As a result, such decomposition leads to *problem nesting*.

1.2.4 Applied Design Science

When we apply the principles of design science to our research, we can reformulate the business question as a practical problem: "How can we search for compatible components offered by a company using ontologies?" In this problem, "we" is a porte-manteau for both internal and external users. Several knowledge problems can be linked to this question:

- Given a camera, how can we detect all compatible flash devices?
- Given a camera, how can we detect all compatible lenses?
- Given a camera, how can we detect all compatible tripods?
- Given a camera, how can we detect all compatible batteries?
- Given a lens, how can we automatize the detection of various types of lenses, i.e. tele lens, macro lens, etc.?
- Given a battery, how can we detect all compatible products?
- Given a flash device, how can we detect all compatible cameras?
- Given a tripod, how can we detect which products it supports?
- Given two products, are these products compatible?
- From a corporate viewpoint, which product is compatible with which other product?

The questions above can be classified as knowledge questions, because at the moment, Sony only has lists of products without any interlinking, e.g. about compatibility, between them. While they

would like to know which product is compatible with another by simply looking at the data. When we try to answer these questions, we must take into account that product compatibility is a complex matter. Products can either be directly compatible, i.e. two products can be connected without the need for any other piece of hardware, or products can be indirectly compatible. In the latter case, we need an additional piece of hardware in order to connect both products. A practical example in our domain is a lens with a mount of type A which can not be connected to a camera with a mount of type E, unless we use a so called mount adapter that allows us to connect both devices.

1.3 Thesis Outline

In Chapter 2 we explore the domain of this master's thesis, we introduce various ontological concepts and we dive into the related work. Chapter 3 forms the methodological framework of our research. Here we explain our study of annotated data and perform a domain analysis. Next the data flow in our project is outlined. We talk about the Semantic Web Rule Language (SWRL) reasoning behind our model in order to infer knowledge. Finally, a proof of concept application is described that illustrates the viability of our methodology. SWRL Reasoning;

In Chapter 4 we apply the method which is outlined in Chapter 3 to our domain. We discuss the most relevant results of our annotation analysis using descriptive statistics. We look at the high level ontology design and explain the concrete SWRL rules used in our project. We also present our proof of concept application in which we show that we can answer the business question successfully. Chapter 5 lists some discussion points that we encountered during our work on the project. We also debate current limitations of our work and possible future enhancements. Finally, we recapitulate the findings of every phase and draw conclusions in Chapter 6.

CHAPTER 2

Background & Related Work

Introduction;
Domain;
Ontological Concepts;
Ontology Construction Tools;
SWRL Reasoning;
Related Work

"True ignorance is not the absence of knowledge, but the refusal to acquire it."

Karl Raimund Popper (⋆ 1902 – 1994 †)

2.1 Introduction

In this Chapter we talk about the domain of digital photography in general, and introduce various concepts related to the domain. Here, we explain specific camera terminology this will be used throughout the master's thesis. We illustrate the terminology by means of annotated product[1] images, whenever possible. Next we discuss general ontology related principles that will be applied in the following Chapters. We conclude with a thorough analysis of the related work with respect to our domain.

2.2 Domain

2.2.1 Digital Cameras

Following the original problem description pitch formulated in Section 1.1, we need to describe the domain of this master's thesis in more detail. When we started working on the project, it became clear that due to the limitations of this work and the available manpower, we needed to focus our attention to a *representative* subset of the general problem. Thus, such a subset should contain most of the complexity of the larger problem, but it should also be small enough in order to be completed by an individual in a three month period. After some discussion, we decided to focus on the domain of *digital photo cameras* with interchangeable lenses.

When we think of traditional analog 35 mm photo cameras, we expect the device to be able to take one or multiple pictures in a sequence. Initially, this was also the case for digital cameras, but nowadays these devices are also capable of recording High Definition (HD) video. As a result we see that the classical division between photo & video cameras is starting to fade. At present, in 2015, there are even broadcast Television (TV) series being recorded using digital cameras, e.g. the Flemish show "Crimi Clowns" [HVG14; Lae12]. As a result, we decided to expand our domain to include video cameras as well. In summary we call this domain *digital cameras*.

2.2.2 Camera Terminology

In order to comprehend the proper terminology used within this domain we explore one of the more advanced digital camera models of Sony, e.g. STL-A99V. The front end of the body of this model is displayed in Figure 2.1, in which we can distinguish two key features. On the one hand there is a *mount* that is used to connect the body of the camera with one of the complementary lenses. On the other hand we see a *shoe* which can be used to plug-in a variety of peripheral devices, but traditionally it is used to connect a flash. The back of the this model is displayed in Figure 2.2 where we find a large Liquid Crystal Display (LCD) and a *viewfinder*, both used to make pictures.

In Figure 2.5 we see a large collection of lenses that can be used in conjunction with the camera. In parlance with the camera terminology, these lenses can be mounted on the body. We can subdivide lenses according to their *focal length*. The simplest subdivision is in either a fixed or non-fixed focal length lens. The latter lenses allow a change of focal length as they traverse from wide to tele mode, see Figure 2.3[2]. We can further subdivide these non-fixed lenses according to their focal length range. This subdivision is illustrated in Figure 2.4[3]and can be summarized as:

- **Wide Angle Lens**: Used for architectural and landscape photography. These lenses have a focal length of less than 35 mm.
- **Normal Lens**: Used for standard photography. There focal length varies from 35 mm to 70 mm.
- **Medium Telephoto Lens**: Used for portraiture photography. The focal length varies from 70 mm to 135 mm.

Figure 2.1: Front-end of Digital Camera Body STL-A99V.

Figure 2.2: Back-end of Digital Camera Body STL-A99V.

- **Telephoto Lens**: Used for sports, or wildlife photography. These lenses have a focal length of more than 135 mm.
- **Fixed Focus Lens**: A lens with one fixed focal length like 35 mm.

Note that the focal length division is partly vendor dependent. E.g., some vendors do not make a distinction between medium telephoto & telephoto lenses. Also the border values are not always the same across vendors. However, in this master's thesis this subdivision will be used.

We also need to mention the *lens thread*, which is located at the end of a lens and can be used to connect a filter or cap.

The claims made in Section 2.2.1 regarding the use of a digital photo camera as a movie camera are further supported by the availability of dedicated options for i.a. the STL-A99V model. These options can be seen in Figure 2.6.

2.2.3 Accessories

Next we look at some of the various accessories that exists within the domain of digital cameras.

Bag Bags are used to transport the body, lenses and other options from place to place. Depending on use & preference of the owner, a bag needs to have certain characteristics. A professional photographer might like a bag with lots of space to store extra batteries and lenses, while an amateur photographer might enjoy a small pouch just large enough to store the device. Also the coating can be of importance as some like natural fibers such as leather, canvas, or cotton, while others prefer modern materials such as ballistic nylon. An example bag is shown in Figure 2.7.

Battery Batteries can also be considered as accessories, since most professional photographers carry one or more spare batteries with. There is some choice in batteries as there are standard batteries with a limited life, and larger, heavier batteries with extended life. An example is shown in Figure 2.8.

Filter Filters are used to obtain special effects in the images produced by the camera. E.g., there exist filters that block a certain color thus in the resulting image that color is omitted. Another example are polarizing filers that tend to minimize unwanted reflections off glass and water into the camera. Again an example is shown in Figure 2.9.

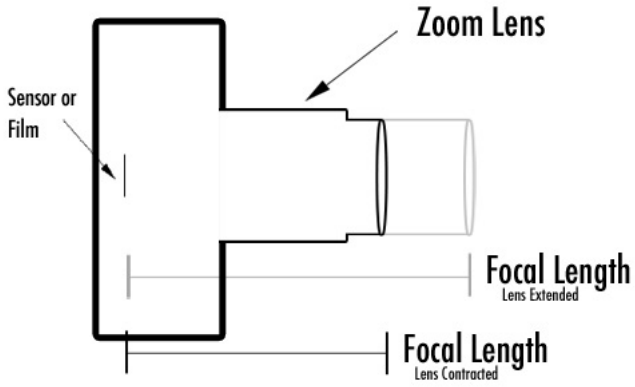

Figure 2.3: Lens Focal Length.

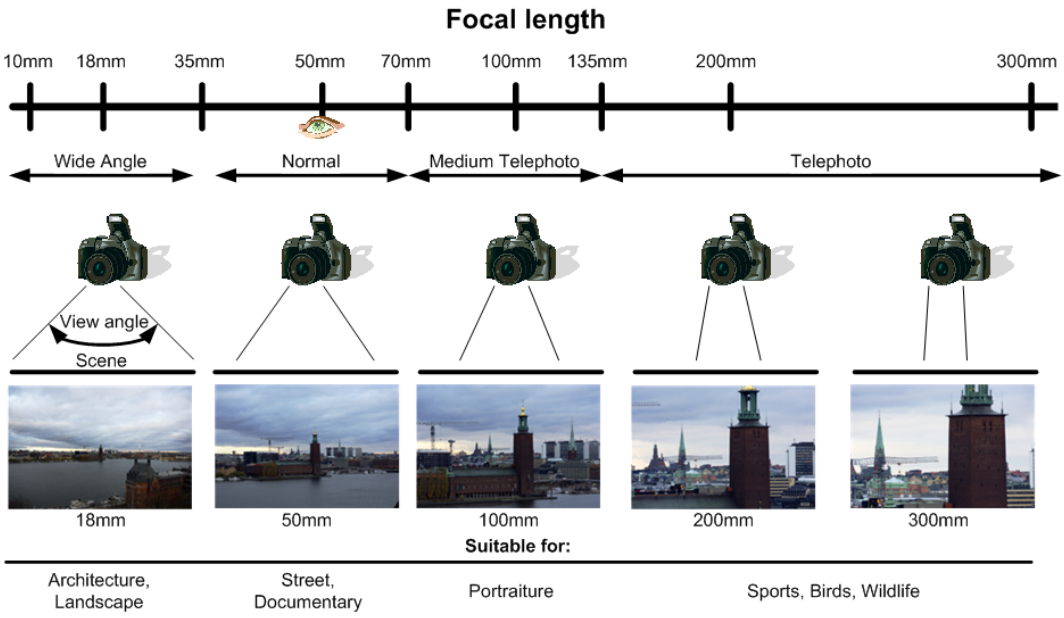

Figure 2.4: Lens Focal Length Subdivision.

Figure 2.5: STL-A99V Compatible Lenses.

Figure 2.6: STL-A99V with Movie Options.

Flash Flash devices are used to illuminate an object so that we can take better images. There exist many varieties of flashes, e.g. the classical camera flash as shown in Figure 2.10. Other types include ring light, see Figure 2.11, and light bulbs. From the latter types we deduce that flash devices are not always used in a "flashing" context, they can also be used to continuously illuminate the object.

Mount Adapter Mount Adapters are used to connect a lens with a certain mount type to a different mount type on the body of the camera, i.e. adapters make it possible to connect lenses and bodies that normally would not be compatible. We illustrate the use of such adapters in Figures 2.12 and 2.13.

Memory Card Memory card is an umbrella term for different kinds of technologies that share the ability to store data and offer an interface to a reader. Popular types of memory cards [eBa14] include:

CompactFlash (CF) This is the fallback standard of flash memory storage. CF cards can be used in a wide variety of devices including digital cameras, Moving Picture Experts Group (1 or 2) Audio Layer III (MP3) players, and embedded systems.

Memory Stick It is a proprietary standard invented by Sony. Memory Stick uses a serial interface to transfer data between the host device and card. Variations exist in the form of Memory Stick PRO, Memory Stick Duo, and Memory Stick Pro Duo. The associated MagicGate technology is Sony's name for Digital Rights Management (DRM), a copy-protection technology.

MultiMedia Card (MMC) The interface pins are on the back side and insert similarly to the Memory Stick. However, MMC is not as widely used. Subtypes exist in the form of Reduced Size MultiMedia Card (RS-MMC), and MMC Mobile.

Secure Digital (SD) Card Shown in Figure 2.15. It is basically the second generation of MMC as they are physically the same. The only exception is the extra locking switch. This switch can prevent data from being read, written, and deleted from the storage card. SD Cards also have DRM capability which lacks in MMC. They exists in the following sub-varieties:

- **MiniSD**: This type was intended to be used in mobile phones and other small devices, such as MP3 players.
- **MicroSD**: The MicroSD card is smaller still than the MiniSD card. It is designed to be used in cellular phones and similar mobile devices.

SmartMedia These cards became extremely popular among manufacturers and consumers, and is smaller and thinner than the CF cards. Its physical structure includes contact pins directly on the surface of the card which proofed to make it less reliable than CF cards. Combined with its lack of large storage capacity, makes it less of a competitor.

eXtreme Digital (XD) Picture Card Specifically developed for use in digital photography products. The XD Picture Cards were designed to diminish power consumption thereby saving the device's battery life. Very few cameras are designed to be compatible with these cards, making XD a legacy format.

Memory Stick Adaptor Memory stick adaptors work like lens adapters except that they allow the camera to use memory cards that normally would be incompatible. E.g., the M2 Duo Adaptor, see Figure 2.14, allows the use of Stick Micro media cards on devices that accept either Memory Stick PRO or Memory Stick PRO Duo cards.

Shoe Adapter The same idea as with Mount Adapters, but in this case we adapt the shoe of the camera in order to make it compatible with peripherals designed for other shoe types, e.g. a flash. Such an adapter is shown in Figure 2.16.

Tripod A tripod is a portable three-legged stand [Mer15], used as a platform for supporting the weight and maintaining the stability of a device, e.g. a digital camera. A tripod provides stability against downward & horizontal forces. An example is shown in Figure 2.17.

Figure 2.7: Bag.

Figure 2.8: Battery.

Figure 2.9: Filter.

Figure 2.10: Flash.

Figure 2.11: Ring LED Light.

Figure 2.12: Mount Adapter.

Figure 2.13: Mount Adapter Demo.

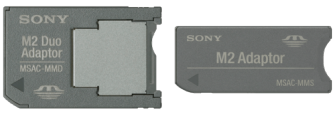

Figure 2.14: Memory Stick Adaptor.

Figure 2.15: SD Card.

Figure 2.16: Shoe Adapter.

Figure 2.17: Tripod.

2.3 Ontological Concepts

During the past decade, effort was spent on generating frameworks in order to facilitate the coming of Web 3.0, also known as the *semantic web* [HB08; Heno9; LH07; SBH06; Yu14]. this requires technology that allows agents, e.g. computers, to reason over existing linked (open) data, see Definition 2.1.

We also need data that commits to these conceptualizations, if we want to support this semantic web [AGvHH12; AH11; HKR09; SET09]. In Linked Data [GHKP12; WZRH13] we describe the *semantics* of the data separate from the specific data structures, i.e. the *syntax*. The resulting data retains its meaning across changes of format, i.e. it is a solution for physical (Uniform Resource Identifier (URI), Hypertext Transfer Protocol (HTTP)) and semantical interoperability of data. The data becomes *self-descriptive*, a requirement of semi-structured data, by relying on shared vocabularies. In other words Linked Data is a way of making the semantic web happen through ontologies (see Definition 2.2), that use Resource Description Framework (RDF) and RDF Schema (RDFS) standards [DMvH+00; HKR09]. In *Linked Open Data*, the basic idea is to apply the general architecture of the World Wide Web (WWW) to the task of sharing structured data on a global scale.

Definition 2.1 (Linked Data & Linked Open Data according to Berners-Lee [Bero9b])

Linked Data refers to a set of best practices for publishing and interlinking structured data on the Web. These practices are known as the "Four Linked Data Principles":

1. Use URIS as names for things.
2. Use HTTP URIS, so that people and user agents can look up, i.e. dereference, those names.
3. When someone looks up a URI, provide useful information, using the standards, e.g. RDF/XML and
   SPARQL Protocol and RDF Query Language (SPARQL) [BACP13; DuC13; PW13].
4. Include links to other URIS, so that they can discover more things.

> Linked Open Data is Linked Data which is released under an open license, which does not impede that its reuse is for free.

Of course, Linked Data does not have to be open in general, but the data becomes more powerful and easier to use for other people if it is open. Therefore a so called star scheme has been devised. Under this scheme, you get one big star if the information has been made public at all, even if it is a photo of a scan of a fax of a table, if it has an open license. On the other hand, you can have 5-star Linked Data, explained below, without it being open. However, if it claims to be Linked Open Data then it does have to be open, to get any star at all.

Linked Data follows the *open-world assumption* [BBC+11] in which there may exist additional sources of data, somewhere, to complement the data at hand. This assumption is optimized for mashing up data from multiple sources and integrating new sources as they are discovered. Opposite, in the closed-world assumption [Rei78] of traditional relational databases we assume that data sources are well-known, controlled and complete, i.e. what is not known to be true in the world must be false.

The fourth principle of Definition 2.1 states that in Linked Data URIs are used to connect disparate data into a single global data space.

On Figure 2.18, we distinguish nine application domains of Linked Open Data each given a unique color. Each concrete application is denoted via a circle. The size of this circle is based on the number of RDF triples in their dataset and the arrows indicate interconnectivity between datasets.

Now that we understand the problem at hand and know about the domain we propose to solve product compatibility issues by constructing an *ontology* [BOF+04; SET09]. This term is widely defined in literature. The two most popular formalizations are given in Definitions 2.2 to 2.3. Next to these general definitions, there exist special domain specific definitions of an ontology. One such example is given by Debruyne [Deb13, p. 9]. Here the definition is tailored for use within the domain of Grounding Ontologies with Social Processes and Natural Language (GOSPL). However, in this master's thesis, we adopt a modified version of the most cited definition, i.e. Gruber.

Definition 2.2 (Ontology according to Gruber [Gru95, p. 908], *modified*)

> A [formal] explicit specification of a [shared] conceptualization.

Definition 2.3 (Ontology according to Guarino and Giaretta [GG95])

> An ontology is a logical theory which gives an explicit, partial account of a conceptualization.

Ontologies [Fen01; Hep08c; UG96] are core components of the semantic web [Col07; Hor08] and offer the opportunity for enhanced dissemination and commercial use of information. Also, on the semantic web the *unique name assumption* [RN09, p. 299; AGvHH12; WY11] does not hold. The

Table 2.1: The Star Scheme.

★	Available on the web, in whatever format but with an open license, i.e. to be Open Data.
★★	Available as machine-readable structured data. e.g. excel instead of image scan of a table.
★★★	Same as ★★ plus non-proprietary format, e.g. CSV instead of excel.
★★★★	All the above plus, Use open standards from W3C, RDF and SPARQL to identify things, so that people can point at your stuff.
★★★★★	All the above plus, Link your data to other people's data to provide context.

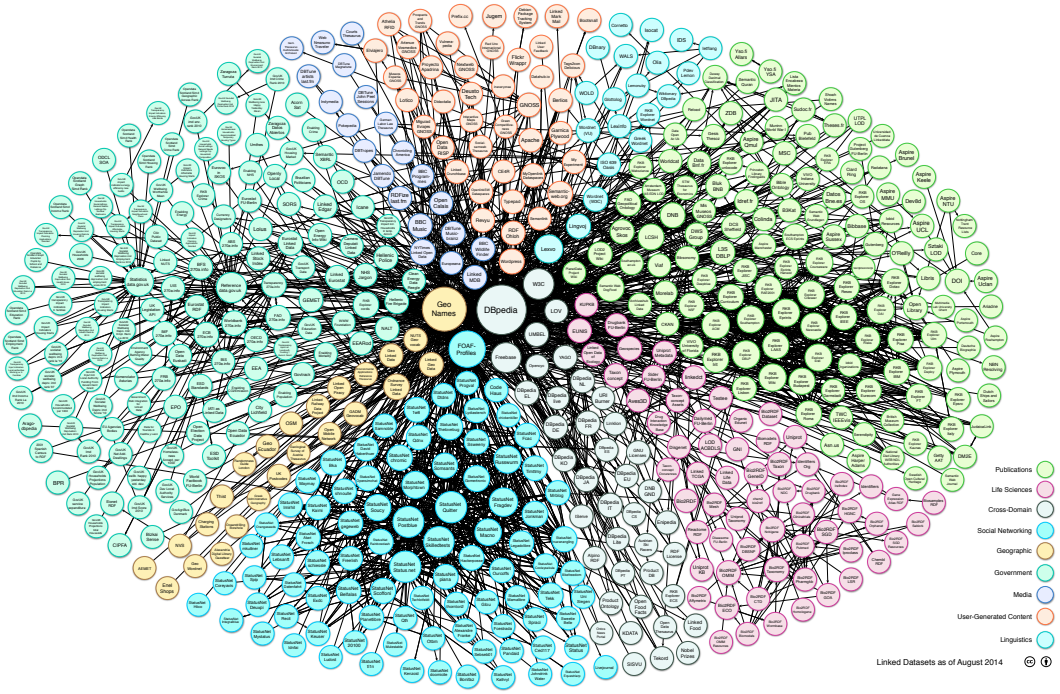

Figure 2.18: Linked Open Data Cloud.

unique name assumption is a simplifying assumption made in some ontology languages and description logics [MCHS09; Mot10]. In logics with the unique name assumption, different names always refer to different entities in the world. This is a principled but unavoidable design choice if different parties are allowed to publish information about the same entity. The standard ontology language Web Ontology Language (OWL) [AGvHH12; CHP+06; Hor05; Pat04] does not make the unique name assumption, but provides explicit constructs to express whether two names denote the same or distinct entities:

- `owl:sameAs` is the OWL property that asserts that two given names or identifiers, e.g. URIs, refer to the same individual or entity.
- `owl:differentFrom` is the OWL property that asserts that two given names or identifiers, e.g. OWLs, refer to different individuals or entities.

Ontologies need to be *engineered* [Hep06a] in order to make them usable in business, this process is formalized in Definition 2.4.

Definition 2.4 (**Ontology Engineering according to Gómez-Pérez, Fernández-López, and Corcho [GFC04, p. v]**)

> Ontological Engineering refers to the set of activities that concern the ontology development process, the ontology life cycle, the methods and methodologies for building ontologies, and the tool suites and languages that support them.

After the ontology is engineered, we need data to test it with. In general, RDF triples are used as the preferred data format (see Definition 2.5). These triples can then be stored in a designated database,

called a *triplestore*. On top of this store, we can write any application that we want in order to answer the question at hand providing an appropriate ontology reasoner.

Definition 2.5 (RDF Triples according to Price [Pri04])

> An RDF file should parse down to a list of triples. A triple consists of a subject, a predicate, and an object. The subject is, well, the subject. It identifies what object the triple is describing. The predicate defines the piece of data in the object we are giving a value to. The object is the actual value.

2.4 Ontology Construction Tools

PROMOD [KTL+06] is a modeling tool [Hor11a] that supports experts in the product domain to produce a conceptual representation which gets translated into OWL. PROMOD uses an extended entity-relationship for its conceptual model, combined with modeling elements tailored for the product domain.

Protégé [BMI15; HPS08; KHM+05] is one of the most widely used development platforms for ontology-based systems. Originally, it was a small application aimed at building knowledge-acquisition tools for a few specialized programs in medical planning [GMF+03; Mus89]. Over the years, its user community has grown rapidly and it is now used in many other application domains [NSD+01]. It has a complex software architecture [GDD09, pp. 194–197], easily extensible through plug-ins. Many components providing interfaces to other knowledge-based tools, e.g. Jess [Fri03] a Java rule engine, have been implemented and integrated into Protégé. Similarly, support is provided for various ontology languages and formats such as XML [MS06], DAML+OIL [Hor02] a description logic, RDFS [AGvHH12; NFM00] and OWL [KFNM04; KHM+05; RKF+05]. Some forms of reasoning over ontologies developed with Protégé [GDD09, pp. 62–64] are also facilitated, e.g. since OWL [AvH09; CHM+08; Pat04] is based on description logics [BHS09; HP04b; KMR04; Krö10; KSH12; KSH14], inferences such as satisfiability and subsumption tests are automatically enabled. Since Protégé is the tool that is most commonly used to create ontologies, we will adopt it too. Furthermore, it supports many useful plug-ins which help during the development of the ontology as well. E.g., build in support for various ontology reasoners and visualizers.

Ontology quality [FH10a; FH10b] can be affected by the difficulties involved in ontology modeling which may imply the appearance of anomalies in ontologies. This situation leads to the need of validating ontologies, that is, assessing their quality and correctness. Ontology validation is a key activity in different ontology engineering scenarios such as development and selection. During the construction of our ontology, we used the web-based tool OOPS! [PGS14] to help us detect these anomalies and potential errors. Hereby this tool improves the quality of our ontology.

2.5 SWRL Reasoning

SWRL [HP04a; HPB+04; HPBT05; LCCH10; OTN+07; Pat05] is a language that is used in the Semantic Web to express rules in a semantic language. It is a combination of the Web Ontology Language Description Logic (OWL DL) and OWL Lite sub languages of OWL complemented with the Unary/Binary Datalog Rule Markup Language (RULE ML) sub languages. The language enables users to extend an OWL knowledge base with Horn-like rules [GHPP09; GHVD03].

The proposed rules consist of two parts where the consequent, i.e. head, is implied by an antecedent, i.e. body. The semantics can be read as: whenever all conditions of the antecedent are fulfilled, then the consequent must also be true. Both head and body consist of zero[4] or more atoms. When we have to deal with multiple atoms, they are treated as a conjunction of them. Atoms are of the form C(?x), P(?x, ?y), sameAs(?x,?y) or differentFrom(?x,?y), where ?x and ?y are variables, OWL individuals or OWL data values. C in this case represent an OWL class, whereas P represents an OWL property.

One big benefit of this language is its human readable syntax. In this syntax, a rule has the form:

$$\text{antecedent} \longmapsto \text{consequent}$$

where both antecedent and consequent are conjunctions of atoms written $a_1 \wedge \ldots \wedge a_n$. Variables are indicated by the standard convention of prefixing them by a question mark. Using this syntax the composition of parent and sister, results in the property aunt:

$$\text{hasParent}(?x,?y) \wedge \text{hasSister}(?y,?z) \longmapsto \text{hasAunt}(?x,?z)$$

Read as: if an instance x has a parent y, and that same instance y has a sister z, then x must have an aunt z. A concrete example of such a SWRL rule in our master's thesis is the case of fixed lenses. A fixed lens has the same focal length in both wide and tele mode. In the mapping phase, we are unable to distinguish between the different cases, i.e. classes, in the taxonomy. As a consequence, we can only detect generic lenses during this phase. So we need to infer this knowledge later on via the reasoner. As an illustration we provide the accompanying SWRL rule for this case:

```
'Lens [Generic Concept: This type of goods]'(?l) ∧
'focal length (0..1)'(?l, ?fl) ∧
'has min value float (1..1)'(?fl, ?flw) ∧
'has max value float (1..1)'(?fl, ?flt) ∧
 equal(?flw, ?flt) ⟼
'Fixed Angle Lens (Photo camera, video camera)  [Generic Concept: This type of goods]'(?l)
```

2.6 Related Work

2.6.1 Existing Product Ontologies & Schemas

The most known ontology in the field of eCommerce is called GoodRelations [ACOH11; Hepo8b], a lightweight product ontology for representing product information. In other words, GoodRelations allows businesses to describe their product offerings, entities and descriptions. The resulting semantically annotated structured data is then accessible for use in different Semantic Web applications and inclusion in search engines indexes. The adoption of GoodRelations is driven by the level of enhanced visibility that a company's products and general profile can receive as a result of it marked-up data being included in the search engine indexes of large providers such as Google and Yahoo. According to Steiner, Troncy, and Hausenblas [STH10], Yahoo and Google include:

- Price.
- Availability, Google only.
- Description.
- Product pictures, drawn from GoodRelations annotated structured data.

as part of their enhanced search results. Adding GoodRelations annotations to a website is also beneficial for the site. BestBuy.com announced an increase of 30% of traffic across their store's pages which contain GoodRelations mark-up. However, there is no study provided in which the BestBuy findings [Mac10] are benchmarked and compared with others.

eClassOWL is a product ontology derived from the eCl@ss product classification standard that is widely adopted by the manufacturing industry [Hep06b; HLS07]. In Table 2.2, we show the twenty-five main branches of the eClassOWL 5.1.4 taxonomy. We can see that this taxonomy is widely applicable, since almost every branch of industry is represented. One should be aware that, at the time of writing, an outdated version of the taxonomy has been represented in OWL. The last update of eClassOWL dates back to April 18, 2010 representing version 5.1.4 of the taxonomy, while as of December 9, 2014 eCl@ss reached version 9.0.

Another building block is called schema.org [Pat14; The15d] which is a collection of schemas, i.e. tags, that web authors can use to mark up their pages. These tags are recognized by search engines like Google, Bing & Yahoo! that use them to optimize their results. Also major companies, like Sony, use schema.org to inform search engines about the content. As a result of this support, schema.org is used on many web pages in important ways. Aside from being a collection of schemas, schema.org is a language for representing information on the Web. Using this language the schemas are organized into a simple taxonomy. However, schema.org lacks a complete definition which limits the possibility of extracting the correct information from pages that use this markup. As a result, this makes schema.org markup an important kind of machine understandable data on the web.

Alternatively, one can use Open Graph Protocol (OGP) [Fac14; Hau10] in order to annotate website. These schemas were originally designed by Facebook for use on their site. Nowadays they are used on many other sites as well. The basic schema includes four mandatory properties to be used on every page: title, type, image, and Uniform Resource Locator (URL). Additionally, this basic schema includes several optional properties. This basic schema is extensible through the definition of custom types which are defined within their own namespace. Within the scope of this master's thesis, we are interested in one specific extension called product [Fac15]. The properties defined in this extension, resemble those defined in schema.org.

ProdLight [Hep07b] focuses on a disadvantage of some product ontologies, i.e. the large number of classes. Ontologies like eClassOWL contain 20 000 to 70 000 classes, making them sometimes unusable for ontology import. Their approach is to represent the semantics of offerings on the Web using a very lightweight ontology of datatype properties in combination with popular hierarchies like eClassOWL. Furthermore, ProdLight offers a way of annotating Web offerings without the need of fully importing product ontologies for any single annotation.

The PRoduct ONTOlogy (PRONTO) [VLH11] is designed for product modeling where coping with product variants is important. An additional focus is placed upon information regarding production, storage, sales and distribution. PRONTO defines two hierarchies to represent the product information:

- Abstraction hierarchy. A product is understood as a complex concept that will be defined at different levels of abstraction, which are organized in an abstraction hierarchy. The term *ProductAbstraction* is used to represent entities at any level of this hierarchy. These *ProductAbstraction*s are defined at different levels, i.e. family, variantSet and product.
- Structural hierarchy. It organizes the specific knowledge associated with product structural information. Within this hierarchy, the information typically handled is the one related to Bill of Materials.

This hierarchy allows efficient handling product information associated with, e.g. a set of similar

Table 2.2: eCl@ss Hierachy.

eCl@ss Hierachy Code	Name of the Top-level Category	Number of Subclasses
17000000	Machines or devices (for special applications)	477
18000000	Equipment for mining, metallurgical plant, rolling mill and foundry	432
19000000	Information, communication, and media technology	503
20000000	Packing materials	785
21000000	Tools	1175
22000000	Construction technology	1074
23000000	Machine elements, fixing, mounting	1138
24000000	Office products etc.	2057
25000000	Services	1276
26000000	Energy, extraction products, secondary raw materials and residues	263
27000000	Electrical engineering, automation, process control engineering	2948
28000000	Automotive technology	246
29000000	Home economics and home technology	450
30000000	Auxiliary supply, additives, formulations	1267
31000000	Polymers	726
32000000	Laboratory materials and laboratory technology	1352
33000000	Installations (complete)	551
34000000	Medicine, medical technology, life science	3249
35000000	Semi-finished products and materials	250
36000000	Machinery and apparatus	1923
37000000	Industrial piping	473
38000000	Inorganic Chemicals	1464
39000000	Organic Chemicals	5354
40000000	Occupational safety, accident prevention	390
41000000	Marketing	506

products. Pronto further simplifies the management of features that are crucial in product representation, such as product families, variants concepts, composition and decomposition structures and the possibility of specifying constraints [Hep07a; PF12].

The Product Modelling Ontology (pmo), a research result of Semantic Web-based Open Engineering Platform (swop) [BBBK09; BBW+15], is a fully generic upper, i.e. top-level, ontology specified in owl. Pmo contains all modeling constructs to make any product ontology while taking into account all relevant product classes, properties and relationships, together with their cardinalities, data types, units and default values. In pmo we can specify rules in the form of:

- Assertions that have to be satisfied.
- Derivations that can be executed which add more complex product knowledge aspects.

In ontology design, popular ontologies are referred with a fixed prefix. E.g., `gr:name` is a shortcut notation for http://purl.org/goodrelations/v1#name. A full list of those common prefixes is provided in Table 2.3.

In Chapter 3 we return to this Section and discuss the ontologies and schemas used in our ontology.

2.6.2 Related Research

Generic research has also been done concerning "Market Driven Product Ontologies" [Mee07]. In this concept Meersman tries to include market information into knowledge systems, and exchange that information amongst partners with minimal loss of information. The integration of market information is done by incorporating market research data with the ontology of an organization in a way that is relevant to the product development process. This approach permits the information from traveling deep down into the fiber of an organization thus contributing to product innovation by placing the ontology at the core of an organization.

Standard product data models enable information exchange across different organizations, actors, processes and stages in the product life cycle [TY08]. These standard models need to support diverse domain specific requirements from the multitude of disciplines involved during a product's life cycle. Due to this diversity, challenges are to:

1. Develop multidisciplinary models.
2. Extend them to support new requirements over time.
3. Implement the resulting gigantic information models.

In order to overcome these challenges, dynamic product data models [KBF12; KBF14][5] is investigated by Krima, Barnard Feeney, and Foufou. In this work, the authors present enhancements to the ISO method for creating such models so that this methodology is also applicable to ontologies and SPARQL Inferencing Notation (spin) for validating product data.

Another research focus is ontology design for product innovation [MD10]. In the context of open innovation, the main shortcoming of ontologies like eClassOWL, GoodRelations, swop, and pronto is that product, component, and property functions are not included. So, in these features are seen as very important assets, rather than tools that drive innovation. Therefore ontologies that want to be valuable in the innovation processes, need to rethink the entire idea of product ontology. Like pronto an ontology for product innovation needs a very gradual product representation. In this case, the product, component and property functions are integrated in this representation. Within product innovation it is not only important to include which products have which components, i.e.

Table 2.3: Common Ontology Prefixes.

Prefix	URL
og	http://ogp.me/ns#
s	http://schema.org/
fb	http://ogp.me/ns/fb#
product	http://ogp.me/ns/product#
dcterms	http://purl.org/dc/terms/
website	http://ogp.me/ns/website#
foaf	http://xmlns.com/foaf/0.1/
dctype	http://purl.org/dc/dcmitype/
owl	http://www.w3.org/2002/07/owl#
swrl	http://www.w3.org/2003/11/swrl#
swrlb	http://www.w3.org/2003/11/swrlb#
dc	http://purl.org/dc/elements/1.1/
gr	http://purl.org/goodrelations/v1#
xsd	http://www.w3.org/2001/XMLSchema#
skos	http://www.w3.org/2004/02/skos/core#
rdfs	http://www.w3.org/2000/01/rdf-schema#
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
eco	http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#

bill of materials, but also which sub-components and properties have a certain function. A useful ontology within this domain also needs to include the entire domain of product application because the usage of the product has great influence on the reasoning behind feature introduction.

When we expand the domain even further, and also expect the ontology to match a customer's purchase intent to specific offers, we need to capture their evolving demands, preferences and perception towards specific products. All these variables can be captured in a request and product ontology [MD11] that can be used to annotate vendor offers. Meersman and Debruyne [MD11] state an important insight regarding the gap between the descriptions of what users want, i.e. their intent, and the availability of this data in the product descriptions. A solution to this issue is provided by the inclusion of *peripheral data*, which vendors can use to innovate according to the wishes of the customers. In this sense, peripheral data can be seen as data that is used by the customer in the purchase decision process, but that is not part of the offering of the product or service provider. It relates directly to the function users want to see performed by the service they book, e.g. to be relaxed, or to have fun. The customers benefice also from this data by receiving increasingly relevant results. To provide this data, a customer-driven innovation system is presented that uses product innovation ontologies [MD10].

In Lee *et al.* [LLL+06], a report is given on an effort to build an operational product ontology system. This system is intended to serve as a product ontology knowledge base, so not only for the design and construction of product databases but also for search and discovery of products and services. The paper provides many insightful hints on how one can design and implement an ontology from scratch. An emphasis is laid upon product information management in an e-commerce environment,

it is therefore vital that a precise definition of product and service are available in a sharable, manageable, flexible, and scalable form, i.e. an ontology. The problem of ranking keyword search results is addressed by modeling the product ontology as a Bayesian network. This approach enables users to reference the product ontology directly through simple keyword search, thereby supporting users with little knowledge about ontology systems. The authors believe that over time an ontology framework will appear, i.e. a web of ontologies for various industry sectors and purposes. Since the time of writing, such ontologies start to emerge. In this framework a central, i.e. upper, ontology will contain the semantic descriptions of common product catalogs and process specifications. This framework will itself provide services to suppliers and consumers of different industries that want their own business processes to be inter-linked with others. This work can be seen as a reference model for similar projects like our ontology construction.

Most of the concepts introduced in Section 2.6 are useful starting points for future enhancements on the ground work that is done in this master's thesis.

CHAPTER 3

Towards The Solution

Introduction;
Overview;
Study of Annotated Data;
Domain Analysis;
Data Processing;
Application

"Every Jack has his Jill." [see Mano7, p. 77]

Everybody will ultimately find a suitable person to share his or her life with

3.1 Introduction

We start by giving an overview of our project, i.e. a general problem solving approach. Next we discuss our approach on analyzing annotated data. We also perform a domain analysis. The results of both analyses are then added to the ontology. We take a look at the data flow concerning our project. This process involves the conversion of the raw data provided by Sony, the data cleanup, and the transformation of the data into triples. At last, we lay out the structure of our proof of concept application. By developing such an application, we show our capability of answering the practical problem posed in Section 1.2.4.

3.2 Overview

As mentioned in Section 1.2.4, our research focuses on one specific practical problem: "How can we search for compatible components offered by a company using ontologies?" Remember that "we" is a porte-manteau for both internal and external users. This question is not specific for the field of digital cameras. Rather it is a general business question applicable to almost every company and/or industry. E.g., at IKEA one might be interested to know which piece of furniture is compatible with another piece. They might define product compatibility as whether or not a drawer fits in a different type of closet. Or they see product compatibility in the sense of color matching, e.g. a black chair is compatible with a black desk. In this last example we might also speak in terms of matching (assorted) products. This question is related to our research question.

In order to answer the practical problem, we constructed an ontology based upon the ontologies and schemas presented in Section 2.6.1. We based our core schema upon the duo GoodRelations & eClassOWL on the one hand, and matched it with schema.org on the other hand whenever possible. GoodRelations was chosen since it is the prominent product ontology [LLL+06], and schema.org because it is the largest annotation schema for Hypertext Markup Language (HTML). Additionally, we matched with OGP if possible. We put in general properties in collaboration with Sony. We checked their proposal against our own study of online annotated data from the main competitors on the Belgian market, i.e. Nikon and Canon. For the sake of completeness, we also looked at the annotated data from Fuji, Leica, Olympus, Panasonic, Ricoh, Samsung, and Sigma. We decided not to include their data in the analysis since they focus on specific target markets. However, even these annotations were taken into consideration during the construction of the ontology. The study was performed according to the quantitative approach described by Bizer *et al.* [BEM+13], and called the breadth analysis. We also received data from Sony with specific camera features in the form of an Access database. We used this data to add specific camera features to the ontology. Next, we used the same approach as above and compared Sony's knowledge with the knowledge, i.e. specifications, available online by the competitors. This study was done mostly by hand, and we call this the depth analysis. During this analysis, several attributes in the ontology were refactored as a consequence.

Finally, we added SWRL rules [HPBT05] to the ontology which describe dynamic reclassification of products. We also used these rules to infer knowledge from the data, e.g. compatible lenses. These rules ware processed by an ontology reasoner capable of processing such SWRL rules. Beware that not every reasoner offers these capabilities, and/or is capable of communicating with Jena. For this reason, we opted to use the Pellet [SPC+07] reasoner.

We proved the viability of our approach by mapping existing camera data to our ontology using RDF Mapping Language (RML). Next we stored the generated triples in a triplestore [CB14] using the persistent layer of Apache Jena [The15a] called TDB.

Finally, we made a proof of concept application demonstrating the capabilities of our approach. Starting from a camera model, we show all direct compatible flashes. We also show both all direct and indirect compatible lenses. A complete schematic overview of our research is provided in Figure 3.1.

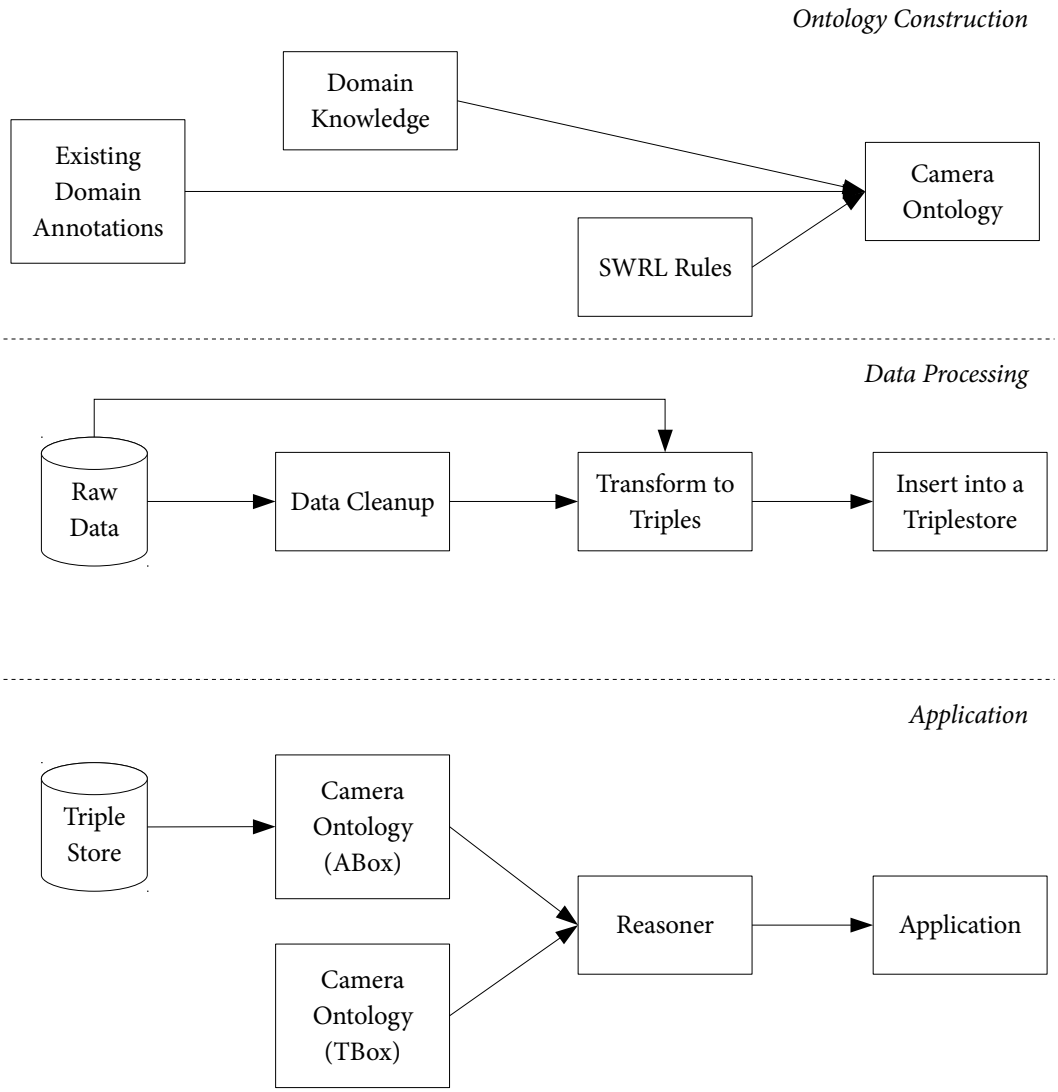

Figure 3.1: Research Phases.

3.3 Study of Annotated Data

As mentioned in Section 3.2, we perform a study on the online annotated data by Sony, and their main competitors. In this study, we are interested in general web annotations, i.e. not camara specific details. For this reason, we call this study a *breadth analysis*. Some general web annotations include:

- Image, e.g. `http://schema.org/image` or `http://ogp.me/ns#image`.
- Description, e.g. `http://schema.org/description` or `http://ogp.me/ns#description`.
- Product, e.g. `http://schema.org/Product` or `http://data-vocabulary.org/Product`.

These examples are all general web annotations, because they can be applied to any type of website and/or type of product. Our methodology is based upon a quantitative analysis [BEM+13] of the HTML files. To get started, we need a common approach to collect, and analyze the pages from the different vendors. Our basic method looks like:

1. Mirror website using HTTrack [Ro15].
2. Select relevant sub domains, e.g. cameras and store. Check if the web pages are accessible using the HTML file location as absolute URL path, i.e. transform the file path into an URL. E.g., on a windows system one needs to transform:
   `c:\website\www.sony.be\nl\electronics\cameralenzen\sel30m35.html`
   into: `http://www.sony.be/nl/electronics/cameralenzen/sel30m35.html`
   If this generated URL is not accessible, remove the extension, or truncate the path up to (and including) the final slash depending on the case.
3. Launch webservice for each page:
   a) Extract Microdata using *Microdata 2 RDF Extractor* [get15a].
   b) Extract RDF in Attributes (RDFA) Lite using *RDFa Lite 2 RDF Extractor* [get15b].
4. Combine the output of Item 3. Because we are not interested in the how or where annotations are made, this can be done without losing context. Perform a cleanup, sort, and count the results using standard Linux commands. We disregard annotations that are not relevant to the field, e.g. Facebook, or Google annotations.
5. Post process the results using statistical analysis software, i.e. IBM SPSS Statistics 21 [Fie13; MAB+13]. In this post processing we want to know if there is any statistical difference in the way vendors annotate.

This method is followed for all the vendors on the Belgian market mentioned in Section 3.2. Except for the last step which is only performed on the three major global players, i.e. Sony, Nikon, and Canon, covering most market segments. The analysis was carried out April 2015 and again in July 2015. The first analysis served as our guideline for attributes that needed to be added to the ontology. We performed this analysis again to provide the most up to date results possible.

We also performed a *depth analysis*, i.e. a comparison in the naming and notation of different camera features used by various vendors. The goal of this analysis is to include as many camera features as possible in the ontology which are shared by the largest group of vendors, i.e. the greatest common denominator. We started this analysis by selecting an entry level, a professional, and a video camera model of each vendor whenever possible. Of each model, we compared different specifications between models from the same and from other vendors. This analysis resulted in a list of features that is shared among the vendors. We verified the output of this analysis with a list of camera specifications provided by Sony as a Microsoft Access[1] database. This list is then added to the ontology as a shared conceptualization of digital cameras.

3.4 Domain Analysis

At the start of our project we were handed a small database consisting of some products to comprehend what Sony stores about a product. Using the Object Role Modeling (ORM) method [HM08] for designing and querying database models at a conceptual level, we are able to get a better understanding of what this database represents. We show the different ORM schemas, each based around one central concept. We call one such schema, a *view*. All these schemas were made using the Natural ORM Architect (NORMA) tool [available from The15c], a Visual Studio[2] plug-in.

This model gave us a first impression on the problem at hand, but as it turned out later on, this model has little in common with the final ontology since the database contains no product specific attributes. It must be seen as a general idea of what is additionally stored internally about a product. The complete model is available on the accompanying website. Next we discuss each view separately:

File View This schema, see Figure 3.2, shows all information stored about a file. In Sony's view, a file can be either:

- documentation, e.g. a Portable Document Format (PDF).
- software, e.g. a driver.
- support information, e.g. links to peripherals.

File Subtype View In parlance with the File View schema, files are subdivided into types, see Figure 3.3. This subdivision occurs in order to identify the files, or group them together.

Product View All information that Sony stores about a generic product, is shown in Figure 3.4.

Product Subcategory View We subdivide products that belong together into categories, see Figure 3.5. This subdivision grew organically/historically, and may sometimes contain inconsistencies when viewed in the light of the present day.

Product Type View When we look at product types, we can make the same remark as with the Product Subcategory View. These product types are shown in Figure 3.6.

Series View Sony, as most vendors, decided to additionally group products together that are targeted for a certain public into so called series, see Figure 3.7. E.g., the series ABC might be entry level digital cameras targeted for occasional, holiday photographers, while the series DEF are targeted for professional photographers.

Stock Keeping Unit (SKU) View Within a company itself, looking at their product portfolio, everything revolves around a concept called SKU, see Figure 3.8, which literally means: "what's on the shelf". The term denotes the *physical* differences between products, cf. the International Standard Book Number (ISBN) in book publishing. E.g., for the base product ABC-123 the following SKUs could exist:

- ABC-123G to denote a green version; ABC-123Y to denote a yellow version.
- ABC-123G5 to denote a five-pack, i.e. the product is sold in groups of five.
- ABC-123G+DEF-456G to denote a bundle of product ABC-123G and DEF-456G. An example of such case might be a base High Fidelity (HIFI) system, i.e. ABC-123G, combined with the speaker set DEF-456G.

Remember that in most instances, customers refer to the base product when they look for support, while companies refer to an SKU.

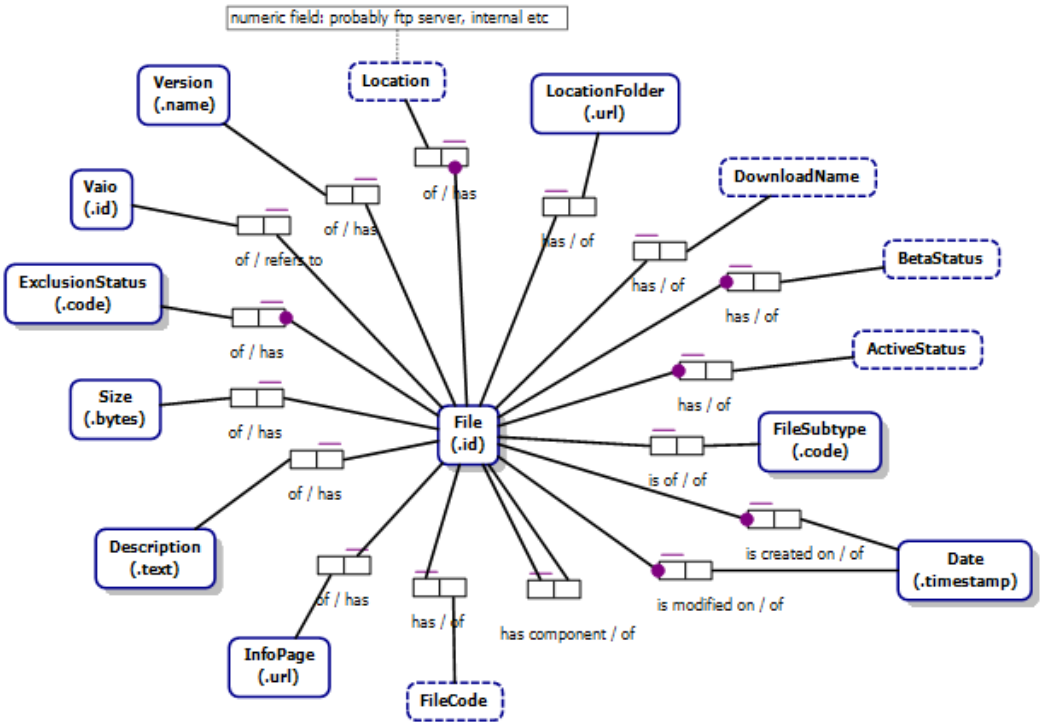

Figure 3.2: File View.

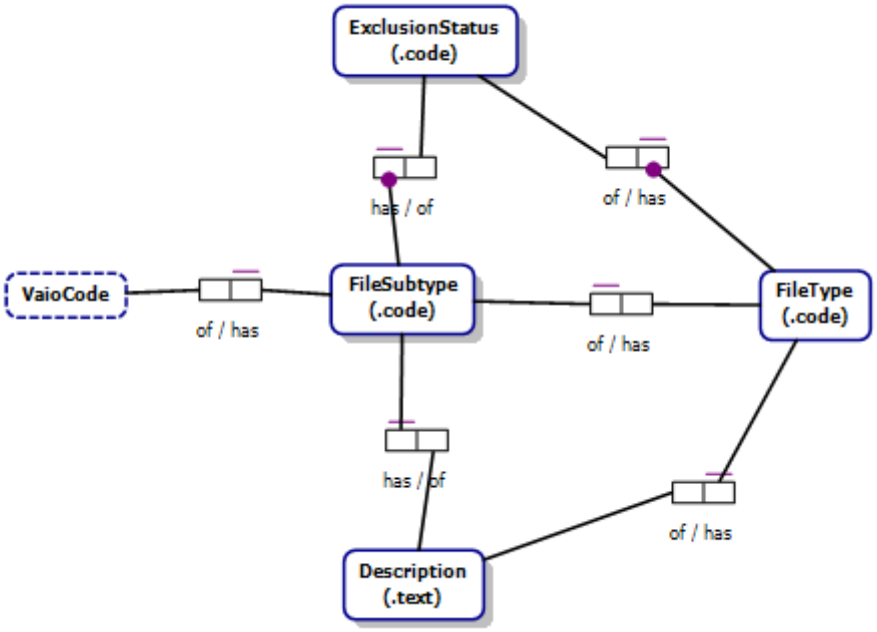

Figure 3.3: File Subtype View.

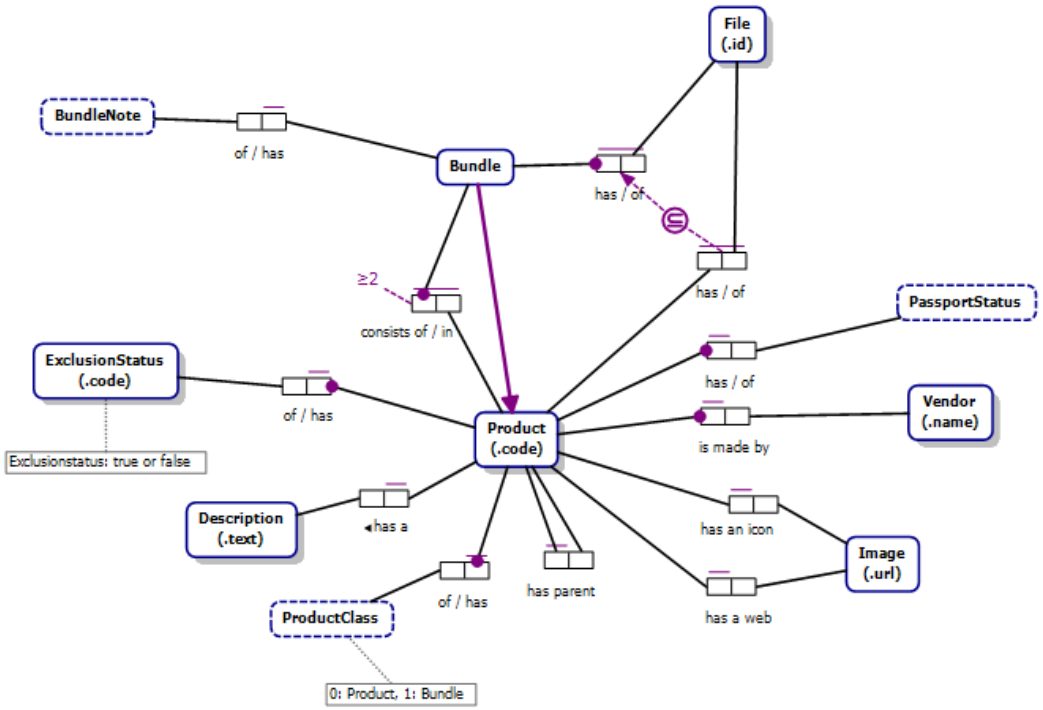

Figure 3.4: Product View.

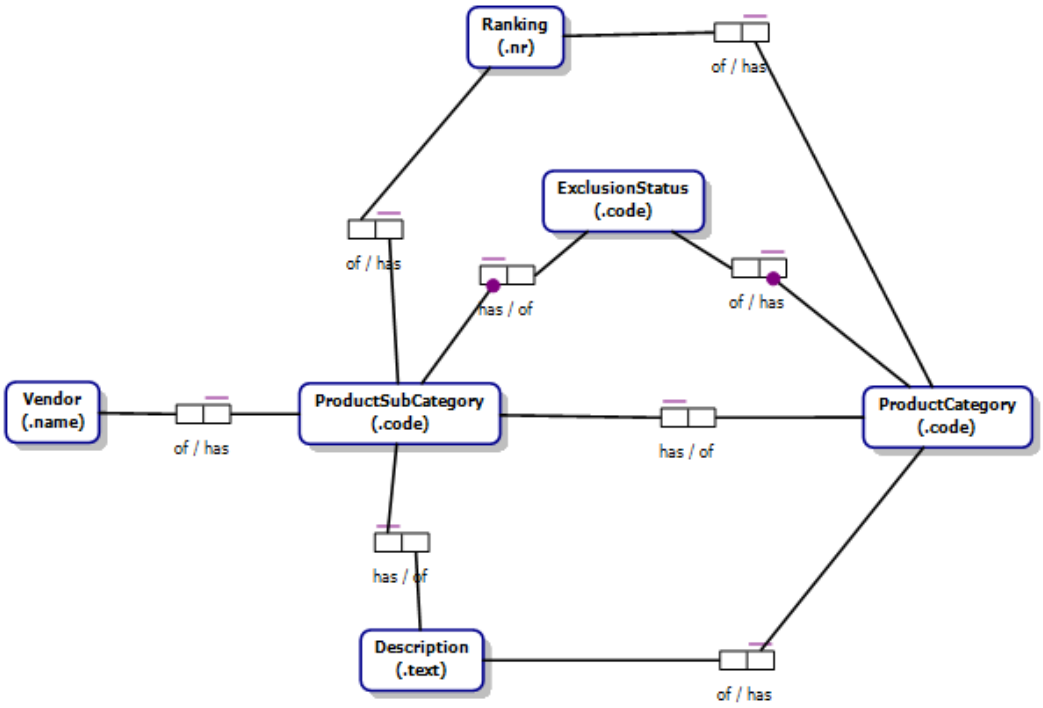

Figure 3.5: Product Subcategory View.

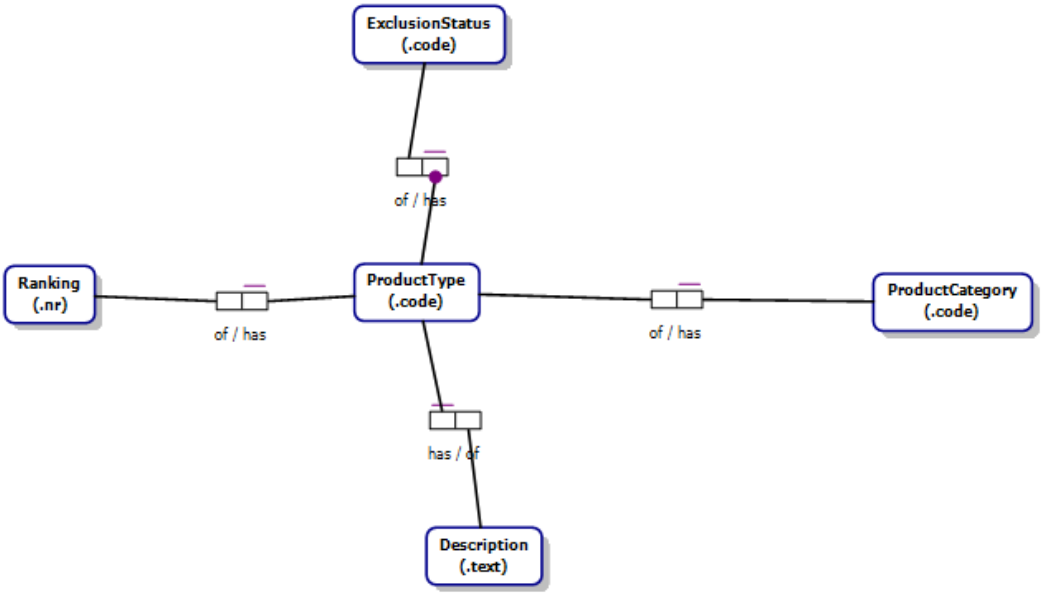

Figure 3.6: Product Type View.

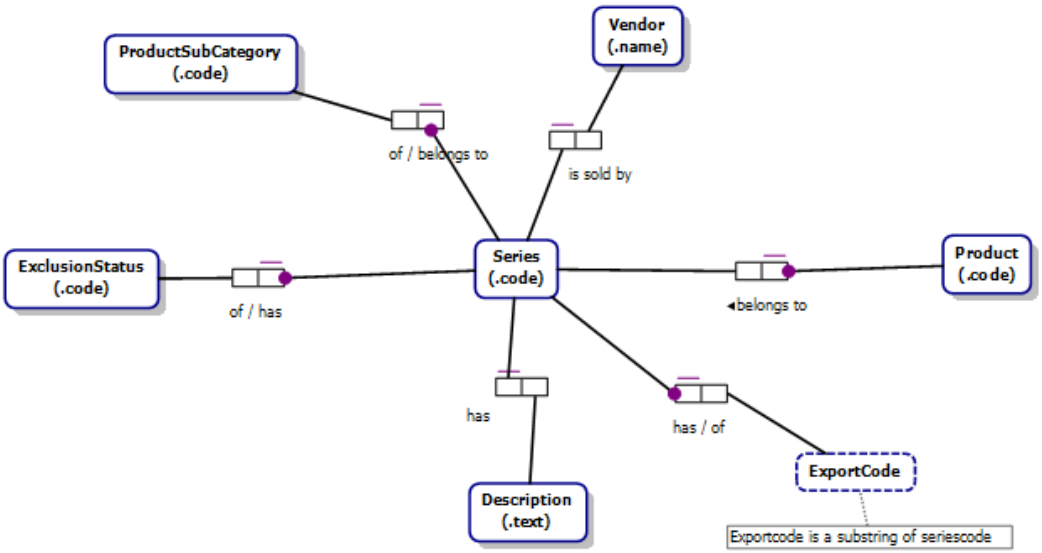

Figure 3.7: Series View.

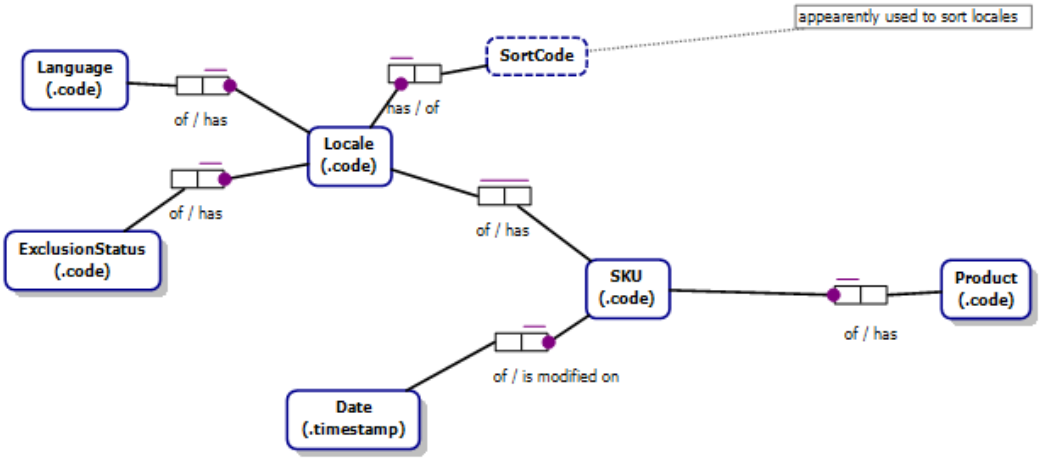

Figure 3.8: Sku View.

3.5 Data Processing

The data processing, see Figure 3.1, in our project starts with a Microsoft Access [Mic15a] database consisting of camera specifications. This database can either be directly mapped to RDF triples, or we can perform additional data cleaning on this raw data. We opted to export the necessary tables from this database to XML files, which are post processed using OpenRefine [VD13]. In this process, called *data cleaning* [JD03], we correct errors that occur in the raw data. Examples include:

- Removing leading and trailing spaces. E.g., replace `DSC-W560␣` by `DSC-W560`.
- Casing issues. E.g., replace `HTTP://sp.sony-europe.com/da/1/1.jpeg` into `http://sp.sony-europe.com/da/1/1.jpeg`.
- Making non absolute URIs absolute. E.g., prepend `/support/s_img/product-icon/EC-1000.jpg` into `http://www.sony.be/support/s_img/product-icon/EC-1000.jpg`.

OpenRefine, formerly Google Refine, is a powerful tool for working with messy data. It allows us to clean & transform the data from one format into another. Because of its powerful features, OpenRefine is chosen as our data cleaning tool.

Next we map the data to triples using the RML [DVC+14] language. RML is an extension to RDB to RDF Mapping Language (R2RML) [VP12; W3C12] language for mapping relational data to RDF triples. In addition RML provides mapping facilities to JavaScript Object Notation (JSON), CSV, or XML data. Because of this broad support of structured data formats, we opted to use this mapping language. Other solutions for exporting data to RDF exist as well. OpenRefine is capable of exporting directly to RDF, but we were unable to find its support for interlinking different XML files or relational tables. Other languages such as SPIN [KHI11] or XQuery SPARQL (XSPARQL) [BDK+12; BLP11], but these were not chosen because together with our partner, we decided that we wanted to split the mapping phase from the data cleaning. Both alternatives provide some cleaning functionality as well and this could lead to work being done twice and to mapping rules that are more complex than technically needed. As an example of RML, we provide the mapping rules of vendors to RDF triples.

```
<#ProductModelsVendor>
  rml:logicalSource [
    rml:source "prd-tbl-models-vendor.xml";
    rml:iterator "/dataroot/prd-tbl-models-vendor";
    rml:referenceFormulation ql:XPath
  ];

  rr:subjectMap [
    rr:template "http://camera.sony.be/productmodelsvendor/{prd-model-vendor-id}";
    rr:class gr:BusinessEntity
  ];

  rr:predicateObjectMap [
    rr:predicate gr:name;
    rr:objectMap [
      rml:reference "prd-model-vendor-name";
      rr:datatype rdfs:Literal
    ]
  ];

  rr:predicateObjectMap [
    rr:predicate cameraontology:grManufactures;
    rr:objectMap [
      rr:parentTriplesMap <#ProductModel>;
      rr:joinCondition [
        rr:child "prd-model-vendor-id";
        rr:parent "prd-model-vendor-id";
      ];
    ]
  ].
```

In the example, we start the mapping from a XML file containing all information relevant in order to map the vendor information. The following rules can be distinguished:

- Declare that vendors are of type `gr:BusinessEntity`.
- Map the vendor name to a `gr:name` attribute.
- Link back to a product model using the `cameraontology:grManufactures` attribute.

When all triples are generated, we store them in a triplestore. For our project, we choose Apache Jena [The15a] as this store runs locally. Jena is a free and open source Java framework for building semantic web and Linked Data applications. The framework is composed of different Application Programming Interfaces (APIs) interacting together to process RDF data. The persistence layer of Jena is called Triplestore Database (TDB) and it can be used as a high performance RDF store on a single machine. A TDB store can be accessed and managed with the provided command line scripts and via the Jena API. When accessed using transactions a TDB dataset is protected against corruption, unexpected process terminations and system crashes. A TDB dataset should only be directly accessed from a single Java Virtual Machine (JVM) at a time otherwise data corruption may occur. If one wishes to share a TDB dataset between multiple applications, the Fuseki [The15b] component must be used. Fuseki provides a SPARQL server that can use TDB for persistent storage and provides the SPARQL protocols for query, update and Representational State Transfer (REST) update over HTTP.

3.6 Application

We show compatible products in the *proof of concept* application by showing the products in one list and linking them to compatible products in another list. A visualization of the products is provided by displaying the accompanying image from the Sony website. In this application we focus on lens, flash, and battery *compatibility*. Thereby we prove that our methodology is capable of answering the practical problem posed in Section 3.2. This application works by invoking the reasoner on both the knowledge base, i.e. the triplestore, and the ontology containing the SWRL rules which define product compatibility. In parlance with ontology terminology, we call the knowledge base the *assertion box* or ABox, and the ontology with the SWRL rules the *terminology box* or TBox. This flow is illustrated in Figure 3.1.

In our application [CHL07], we use the Pellet [SPC+07] reasoner because of its known compatibility with Jena, but many other OWL reasoners [Abb12] exist that may outperform Pellet [DCtTdK11; Pan05] in a real world implementation. E.g., HermiT [GHM+14; HMW12; SMH08] which is the default reasoner shipped with the Protégé [BMI15; KHM+05] OWL Integrated Development Environment (IDE) that is used to construct the camera ontology. Another popular reasoner is called FaCT++ [TH06], the default reasoner in earlier versions of Protégé. The IDE has changed its default reasoner because the algorithm behind the HermiT reasoner, i.e. hyper tableau, has proven to outperform other existing reasoners. Aside from a performance issue, both reasoners implement the same default OWL API, while Pellet implements its own API which is aligned with the Jena API. So we can conclude that if we want Jena to work with another reasoner, we must translate our Jena model in code into a model compatible with the OWL API. Of course, working with another triplestore can improve the integration with the OWL API.

CHAPTER 4

Implementation

Introduction;
Annotation Analysis;
Highlevel Ontology;
SWRL Reasoning;
Proof of Concept

"The rooster makes more racket
than the hen that laid the egg." [see Har81, p. 151]

Joel Chandler Harris (⋆ 1848 – 1908 †)

4.1 Introduction

In this Chapter, we look at the results from our annotation analysis. We discuss the high-level architecture of the camera ontology. Next, we review the SWRL rules that were written with respect to our proof of concept application. Here, we discuss both direct and indirect compatibility rules. Last we talk about the technical implementation of the application.

4.2 Annotation Analysis

First we started by examining the number and type of semantic annotations used at the websites of players on the camera market, see Table 4.2 for the results of our July 2015 study. We used the program HTTrack [R015] to navigate the web pages of Sony and its competitors up to three levels deep. In Table 4.2 we made a distinction between the key players in the camera market share. The selection of key players is based upon a market study [Dam14] of which the results are shown in Table 4.1.

Based on these results, we first performed a quantitative analysis of these results. This descriptive analysis is used to determine which ontologies, schemas, or meta-schemas[1] are currently used and can be valuable for the creation of the product ontology. After this we rely on inferential statistics to make a distinction between the use of schemas in the key player part of the market.

4.2.1 Descriptive Statistics

Using the HTTrack navigational search, we distinguished 43 different kinds of semantic annotations following a certain schema. The two most prominent schemas used in all these web pages are *schema.org* and OGP. A lot of these annotations are very generic: web pages, images, products, etc.. In total we found 54 077 annotations on the 10 websites, i.e. Sony and 9 other camera vendors, starting from the product catalog and navigating maximum three links deep. 30 451 of the 54 077 or 56.31% were made on the Sony website. Moreover, when we look at single annotations[2] we count 27 different annotations of them. 18 of the 27 or 66% of these single annotations are made by Sony. Thus we can state that, however the number of specific annotations are low, Sony outperforms the rest based on the nominal counts of the annotations.

4.2.2 Inferential Statistics

In this section we are interested in a possible difference in use of annotations between the three most important players on the camera market, i.e. Sony, Canon, and Nikon. For this analysis, our null hypothesis will be that there is no difference between the number of annotations on the product's website of camera vendors. We can rephrase this into a question: "Is the occurrence of a semantic annotation to an ontology, schema or metaschema, distributed homogeneously over these three camera vendors?"

Since we deal with a categoric variable, i.e. ontology link on Figure 4.1, we will perform a χ^2 (Chi Square) analysis. From Section 4.2.1 on descriptive statistics, we can already assume that Sony will have more semantic annotations than the other vendors. However we need statistical evidence to support this assumption. Since we do not know the distribution of this variable, we will use the non-parametric form of the Chi Square analysis. We use this type of test since it always applies, even if the data is normally distributed. We will test this at the $\alpha = 0.05$ level.

We end up with a statistical result with 42 degrees of freedom[3], see Figure 4.1. In this SPSS output we end up with a p value smaller than 0.001. This means that we can reject our null hypothesis and accept the alternative hypothesis of this χ^2 test. This alternative hypothesis is that there is a difference

Table 4.1: Digital Camera Market Share Breakdown.

Vendor	Market Share
Canon	20.52%
Sony	19.33%
Nikon	13.61%
Samsung	11.99%
Panasonic	8.21%
Olympus	6.59%
Fuji	5.29%
Casio	4.32%
Pentax	1.62%
Vivitar	1.30%
Other	7.24%

Test Statistics

	Ontology link
Chi-Square	70092,442[a]
df	42
Asymp. Sig.	0,000

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 732,7.

Figure 4.1: χ^2 Analysis.

between the number of annotations. As stated earlier, by observing the data we see that Sony has a significant higher number of annotations, which is now statistically sound.

Table 4.2: July 2015 Annotation Analysis.

	Three Major Vendors					Seven Other Vendors				
Annotation	**Sony**	**Nikon**	**Canon**	**Fuji**	**Leica**	**Olympus**	**Panasonic**	**Ricoh**	**Samsung**	**Sigma**
Type http://schema.org/WebPage	1352	114	152	415	75	0	624	1742	101	0
Type http://schema.org/Product	2547	0	0	0	0	0	0	0	0	0
Type http://schema.org/Offer	787	0	0	0	0	0	0	0	0	0
Type http://schema.org/Review	58	0	0	0	0	0	0	0	0	0
Type http://schema.org/Rating	58	0	0	0	0	0	0	0	0	0
Type http://schema.org/AggregateRating	799	0	0	0	0	0	0	0	0	0
Type http://schema.org/VideoObject	0	0	0	0	0	0	0	34	0	0
Type http://data-vocabulary.org/Product	0	0	0	0	0	0	0	0	83	0
Type http://ogp.me/ns#type Product	917	0	0	37	0	0	0	1451	84	0
Type http://ogp.me/ns#type Website	0	0	0	378	0	0	2	0	0	0
Type http://ogp.me/ns#type Article	0	0	0	378	0	0	622	271	0	0
Type http://ogp.me/ns#type Type Category	0	0	0	0	0	0	0	0	17	0
Attribute http://rdf.data-vocabulary.org/#title	0	0	0	0	0	0	0	0	97	0
Attribute http://ogp.me/ns#image	917	0	152	415	0	0	1062	1953	101	0
Attribute http://ogp.me/ns#title	917	0	0	415	0	0	624	1722	101	0
Attribute http://ogp.me/ns#description	917	0	0	616	0	0	585	1722	101	0
Attribute http://ogp.me/ns#url	917	0	0	415	0	0	2	1722	101	0
Attribute http://ogp.me/ns#site_name	917	0	0	415	0	0	2	1722	101	0
Attribute http://ogp.me/ns#locale	917	0	0	415	0	0	0	0	0	0
Attribute http://ogp.me/ns#country-name	0	0	0	0	0	0	0	0	101	0
Attribute http://schema.org/identifier	0	0	0	0	0	0	0	0	83	0
Attribute http://schema.org/name	2605	318	0	0	0	0	0	23	83	0
Attribute http://schema.org/description	58	0	0	0	0	0	0	45	83	0
Attribute http://schema.org/image	2932	0	0	0	581	0	0	0	714	0
Attribute http://schema.org/video	0	0	0	0	0	0	0	34	0	0
Attribute http://schema.org/duration	0	0	0	0	0	0	0	34	0	0
Attribute http://schema.org/color	757	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/model	5568	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/url	2112	318	0	0	0	0	0	0	0	0
Attribute http://schema.org/datePublished	58	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/author	58	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/reviewRating	58	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/review	58	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/reviewCount	11	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/bestRating	69	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/itemReviewed	69	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/price	787	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/offers	787	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/ratingValue	857	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/ratingCount	788	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/aggregateRating	799	0	0	0	0	0	0	0	0	0
Attribute http://schema.org/thumbnailURL	0	0	0	0	0	0	0	34	0	0
Attribute http://schema.org/embedURL	0	0	0	0	0	0	0	34	0	0

4.3 Highlevel Ontology

Rather than discussing every property that we added to the ontology, we discuss different pillars on which the ontology is built. The first pillar is that of the core ontology. We build our camera ontology on top of GoodRelations since it is the product ontology that is most widely supported on the web. We coupled this core ontology with the most prominent taxonomy available in OWL, called eClassOWL. This taxonomy implementation has the added benefit of being compatible with GoodRelations. At this point we had a good discussion with our partner on which classes and properties we should add to the ontology. We have decided that we should focus on the GoodRelations classes `gr:ProductOrService`, `gr:Offering`, and `gr:BusinessEntity`. On the side of the properties, we added basic data properties such as name, description, and color. The chosen object properties include the important links between the classes presented earlier. In eClassOWL our core discussion point was the representation of cameras. In eClassOWL we could make two choices:

1. Represent both photo cameras and video cameras as separate eClassOWL classes. Therefore we should use the class `eco:#C_AKN885002-gen` to represent photo cameras, and the class `eco:#C_AKN886002-gen` to represent video cameras.
2. Do not make a distinction between photo & video cameras. Therefore we should map every camera using the class `eco:#C_AKN884002-gen`.

After some discussion we chose the latter choice, since nowadays the distinction between photo & video cameras is becoming more and more vague. We have also added classes to the taxonomy to represent accessories that belong to cameras, if they were not already present. An important side remarks must be made here. At the time of construction, it took minutes for browsers to display the eClassOWL documentation. And even then, this documentation is difficult to navigate and read. So we decided to write a program that transforms this HTML documentation into several CSV files. Our program honors the official Request for Comments (RFC) specification [Sha05]. The code for this program is attached in Appendix A.1.

The second pillar is that of our own breadth analysis. We added general properties that are broadly supported by the camera vendors. This means that we also added properties that are strictly unrelated to the digital camera domain, but can be coupled with it. An example is anything related to reviews. Many vendors annotate their products with review provided in by their customers. In our ontology, we can reuse these annotations and reason over these properties.

A third pillar is schema.org as it is the most popular annotation scheme on the web. In our ontology, we match it with as many classes and properties as possible. This allows vendors using this schema to reuse their annotations in the ontology.

The classes and properties added by the second and third pillar are not camera specific, so the fourth pillar needs to add these properties. This is why we performed our depth analysis. The result of this analysis are camera properties shared by the various vendors. These properties were added according to the recommendations of both GoodRelations and eClassOWL. According to them these properties either need to be quantitative, qualitative, or datatype. Before adding a property, it is evaluated *in order* against:

- Quantitative properties: For typical product features with a numeric range. Each quantitative property is a subproperty of `gr:quantitativeProductOrServiceProperty`. The actual range for such values can be either an integer or float interval.
- Qualitative properties: For product features with predefined value instances. Each qualitative property is a subproperty of `gr:qualitativeProductOrServiceProperty`.

- Datatype properties: Used only for a few features with the datatypes string, date, time, datetime, or boolean. Each datatype property is a subproperty of `gr:datatypeProductOrServiceProperty`. In other words, only such properties that are no quantitative properties and that have no predefined value instances are subproperties of this property.

For reasons explained in more detail in the GoodRelations technical report [Hepo8a], `gr:datatypeProductOrServiceProperty` is an `owl:DatatypeProperty` [MHo8], and both `gr:qualitativeProductOrServiceProperty` and `gr:quantitativeProductOrServiceProperty` are `owl:ObjectProperties`. In short this is because ranges are represented in GoodRelations as instances of a QuantitativeValue class, for they can otherwise hardly be represented in OWL.

The fifth pillar is a representation of Sony's internal product classification taxonomy and the coupling with our core ontology [Hepo5]. Therefore we used the results from our domain analysis and the accompanying ORM model. This taxonomy allows product lookup using its product type, category, subcategory, and series. This classification also couples content files to a product. Content files can be a manual, driver, additional software, etc.. These files can alternatively be looked up using their content type, and subtype.

The sixth and final pillar is focused towards our proof of concept application. In this application, we show that we can solve the practical problem stated in Section 1.2.4. Therefore we add properties that capture these compatibility relationships. This compatibility pillar is shown in Figure 4.2

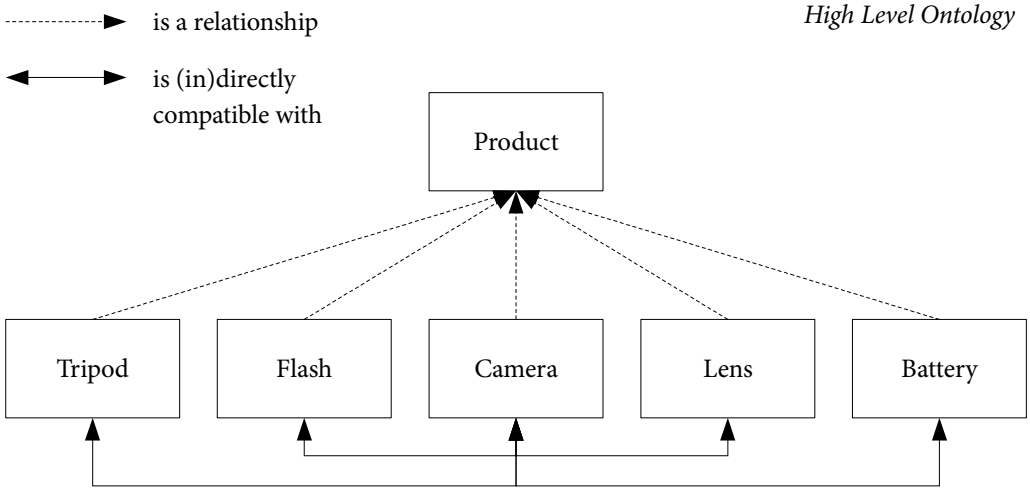

Figure 4.2: Highlevel Ontology Compatibility View.

4.4 SWRL Reasoning

In our ontology, we added 18 SWRL rules with respect to our proof of concept application. Rather than explaining each one, we will explain one rule of each of the two rule group that are present in the ontology. As explained in Section 3.6, our application focuses on product compatibility. The first group of rules concerns product compatibility, which can either be direct or indirect.

As an example to explain product compatibility, we choose the compatibility between a flash device and a camera. Direct compatibility implies that both the flash device and the camera share the same shoe type. Optionally, we could define that the gender of the shoe type on both products is opposite. In our rules we omitted this because it requires more reasoning power, and in the dataset that our partner provided it is always the case. However in the direct rule we show how one could add this condition, if needed.

```
'accessory interface shoe (0..1)'(?c, ?s) ∧
'camera interface shoe (1..1)'(?f, ?s) ∧
'Photo camera, video camera [Generic Concept: This type of goods]'(?c) ∧
'Flash device [Generic Concept: This type of goods]'(?f) ⟼
 isDirectFlashOf(?f, ?c)
```

The rule above starts by selecting an accessory & camera interface shoe and then it verifies whether the accessory interface shoe belongs to a camera instead of a shoe adapter and whether the camera interface shoe belongs to a flash device instead of a shoe adapter. If we would like to check the gender of the shoe type as well, then we should change the rule to:

```
'accessory interface shoe (0..1)'(?c, ?s) ∧
'accessory interface shoe gender (0..1)'(?c, ?csg) ∧
'camera interface shoe (1..1)'(?f, ?s) ∧
'camera interface shoe gender (0..1)'(?f, ?fsg) ∧
 DifferentFrom(?csg, ?fsg) ∧
'Photo camera, video camera [Generic Concept: This type of goods]'(?c) ∧
'Flash device [Generic Concept: This type of goods]'(?f) ⟼
 isDirectFlashOf(?f, ?c)
```

Next we have the indirect rule. This rule splits out into two rules as there is one rule connecting the flash device to a shoe adapter, and another rule to connect the shoe adapter to the camera. In these rules we do not consider recursion, as in practice, this almost never occurs. Recursion means that one could potentially have multiple shoe adapter on each other to connect a flash to a camera. Since this case occurs only sporadicly, we omit it. The first sub rule connects the flash device with a shoe adapter:

```
'accessory interface shoe (0..1)'(?sa, ?st) ∧
'camera interface shoe (1..1)'(?f, ?st) ∧
'Shoe Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]'(?sa) ∧
'Flash device [Generic Concept: This type of goods]'(?f) ⟼
 isIndirectFlashCameraInterfaceOf(?sa, ?f)
```

The logic behind the rule is almost identical to the logic behind the direct compatibility rule. Only here we check the flash against an auxiliary device, i.e. shoe adapter. Here we check the shoe type on the accessory side since this is the side of the shoe adapter on which we need to plug in the flash. Next we check whether the shoe adapter fits on the camera:

```
'accessory interface shoe (0..1)'(?c, ?sst) ∧
'camera interface shoe (1..1)'(?sb, ?sst) ∧
'Shoe Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]'(?sb) ∧
'Photo camera, video camera [Generic Concept: This type of goods]'(?c) ⟼
 isIndirectFlashAccessoryInterfaceOf(?sb, ?c)
```

Also, here the logic is almost the same as with the direct case, and it is a mirror of the indirect rule discussed above. Here we check the camera interface shoe of the shoe adapter against the accessory interface shoe of the camera. Again, we could adapt both sub rules to check on gender. As this alteration is similar to the one provided in the direct rule, we leave it to the reader to make this change. Implementing recursion in this rule expects writing an additional rule that checks for compatibility between two shoe adapters, as in:

```
'camera interface shoe (1..1)'(?sa, ?sst) ∧
'accessory interface shoe (0..1)'(?sb, ?sst) ∧
'Shoe Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]'(?sa) ∧
'Shoe Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]'(?sb) ⟼
 isShoeOnShoeAdapterOf(?sa, ?sb)
```

Read the example above as: shoe adapter A on top of shoe adapter B, i.e. B is connected to the camera while A can be connected to the flash device. The other rule group consists of reclassification rules concerning lenses. A rule of this category is already presented in Section 2.5, but we will introduce another: a medium telephoto lens.

```
'Lens [Generic Concept: This type of goods]'(?l) ∧
'focal length (0..1)'(?l, ?fl) ∧
'has max value float (1..1)'(?fl, ?flt) ∧
 greaterThan(?flt, 70.0) ∧
 lessThan(?flt, 135.0) ⟼
'Medium Telephoto Lens (Photo camera, video camera)  [Generic Concept: This type of goods]'(?l)
```

In this case we check whether the lens has a max focal length, i.e. focal length in tele mode, that is greater than 70 mm but less than 135 mm. If this is the case, the lens is classified as a medium telephoto lens. All 18 SWRL rules can be found in the ontology, see Appendix B.2.

4.5 Proof of Concept

As explained in Section 3.6 we wrote an application in order to prove that we are capable of answering the practical problem posed in Section 1.2.4. We first started by mapping product data to our ontology using RML. These triples are then stored in a Jena TDB. Finally, we wrote an application in Java [Hor11b; LL14] that reads both the ontology and the triplestore and starts reasoning [HPPR11] over them using Pellet. On top of this core application, we wrote a simple Graphical User Interface (GUI) that illustrates product compatibility by showing which camera in compatible with which flash (see Figure 4.3), battery(see Figure 4.4), and tripod (see Figure 4.5). The compatibility is shown on the basis of the URI representing the product which is, for the sake of debugging, based upon the model identifier in the product database provided by Sony. Because this information is of little use to the beholder, we provide the option of additionally showing the product model and image. This information is retrievable by means of an extra SPARQL query [BBM+11]. Thereby we also illustrate our querying capability. We discuss the core code in part by part.

In the first snippet we either connect to an existing Jena TDB containing our model, or we generate the model and then store it in the triplestore based upon the mapped triples which are stored in separate files. Each file represents another part of the model. The core model is stored in `db.output.nt` which includes a representation of the entire internal database provided by Sony. Herein we find the data representing the internal product classification as well as general properties such as name, image, and description. The nine other files are based upon a mapping of the `draft.xml` file which contains specific product information. In order to debug these mappings, we split them out according to the

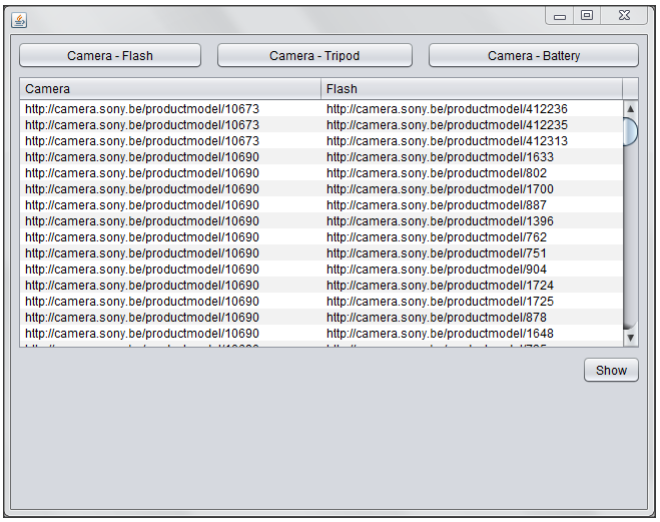

Figure 4.3: Camera Flash Compatibility.

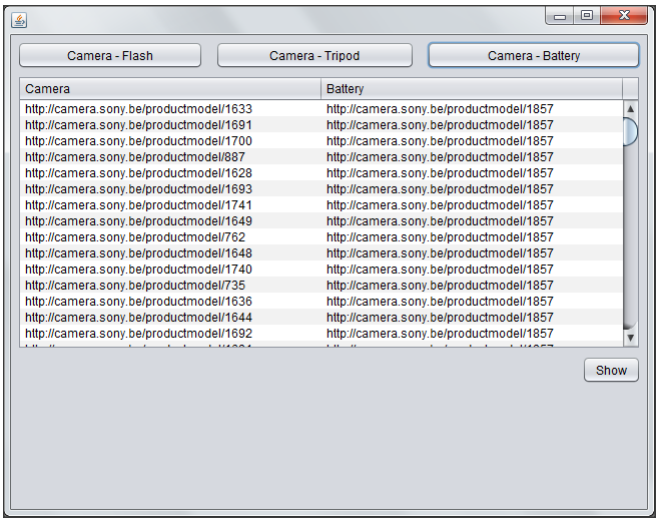

Figure 4.4: Camera Battery Compatibility.

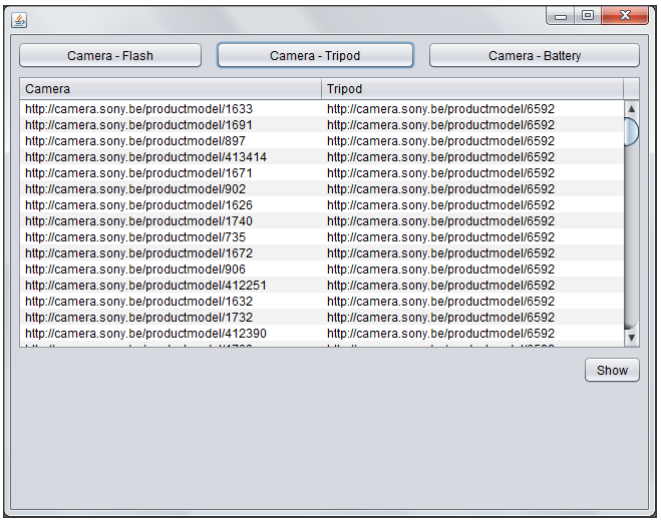

Figure 4.5: Camera Tripod Compatibility.

type of product which they represent. E.g., `lens.output.nt` contains the triples that represent specific lens properties. This split has an added benefit. Suppose we made an error in the mapping of these properties, we only need to adapt the mapping file responsible for generating these properties and rerun the mapping. We have to warn the beholder that mapping large quantities of data can be time consuming. The mapping of `db.output.nt` which contains 1 499 738 triples took over 50 hours on a core i5 computer.

```
dataset = TDBFactory.createDataset(tdbDirectory);

if (createTdb) {
    tdb = dataset.getDefaultModel();

    String dbdump1 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\alpha.output.nt";
    String dbdump2 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\battery.output.nt";
    String dbdump3 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\cam.output.nt";
    String dbdump4 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\compact.output.nt";
    String dbdump5 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\db.output.nt";
    String dbdump6 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\flash.output.nt";
    String dbdump7 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\lens.output.nt";
    String dbdump8 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\mount.output.nt";
    String dbdump9 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\shoe.output.nt";
    String dbdump10 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\tripod.output.nt";

    FileManager.get().readModel(tdb, dbdump1, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump2, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump3, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump4, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump5, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump6, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump7, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump8, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump9, "N-TRIPLES");
    FileManager.get().readModel(tdb, dbdump10, "N-TRIPLES");

    dataset.addNamedModel(tdbModel, tdb);
} else {
    tdb = dataset.getNamedModel(tdbModel);
}
```

In the second snippet we create the OWL reasoner, in our case Pellet. We create the inference model

from both the reasoner, and the triplestore. Next we read in the ontology from its URI. This will trigger the reasoner to start its work and execute the SWRL rules making the model ready to be queried.

```
Reasoner reasoner = PelletReasonerFactory.theInstance().create();

infModel = ModelFactory.createInfModel(reasoner, tdb);
try {
    // 2nd argument is the base URL
    infModel.read(new URL(coUrl).openStream(), null);
} catch (MalformedURLException ex) {
    Logger.getLogger(SWRLReasoner.class.getName()).log(Level.SEVERE, null, ex);
} catch (IOException ex) {
    Logger.getLogger(SWRLReasoner.class.getName()).log(Level.SEVERE, null, ex);
}
```

The third snippet shows the different SPARQL queries used in this proof of concept. We will explain some cases. In the first string, we extract all directly compatible lenses from the store, and in the second string we do the same for camera batteries. The sixth and seventh string work together to find indirectly compatible filters, i.e. filters that are compatible to a lens via a filter adapter. In string twelve we locate all fixed lenses.

```
String sparqlQueryString1 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "prefix gr: <http://purl.org/goodrelations/v1#> "
    + "SELECT ?l ?c  WHERE {?lens cameraontology:isDirectLensOf ?c."
    + "?lens gr:description ?l}";

String sparqlQueryString2 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "prefix gr: <http://purl.org/goodrelations/v1#> "
    + "SELECT ?b ?c  WHERE {?b cameraontology:isCameraBatteryOf ?c.}";

String sparqlQueryString3 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT distinct ?f ?c  WHERE {?f cameraontology:isDirectFlashOf ?c.}";

String sparqlQueryString4 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?t ?c  WHERE {?t cameraontology:isTripodOf ?c.}";

String sparqlQueryString5 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isDirectFilterOf ?c.}";

String sparqlQueryString6 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFilterAccessoryInterfaceOf ?c.}";

String sparqlQueryString7 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFilterLensInterfaceOf ?c.}";

String sparqlQueryString8 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectLensAccessoryInterfaceOf ?c.}";

String sparqlQueryString9 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectLensCameraInterfaceOf ?c.}";

String sparqlQueryString10 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFlashAccessoryInterfaceOf ?c.}";

String sparqlQueryString11 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFlashCameraInterfaceOf ?c.}";

String sparqlQueryString12 =
    "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
    + "prefix eclass: <http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#>  "
    + "SELECT distinct ?l  WHERE { ?l <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> "
    + "cameraontology:FixedAngleLensGeneric.}";
```

In the fourth and final snippet we show our code for executing the queries presented in the previous snippet. Based upon a given query in string format, we generate the accompanying `Query` object. Next we execute this query against the inference model created in snippet two. When the query is executed, the result gets stored in a `ResultSet` object. We can then iterate over this object as it implements the `Iterator` interface. At each iteration, we find an instance of `QuerySolution`. This object holds the answer to the query in each column. Java allows us to access these columns via there given name in the query. This explains why we pass an additional two parameters called `var1` and `var2` to our `getResult` method. During the iteration over the `ResultSet` object, we store the results in our own data structure, i.e. an `ArrayList`, which we use in the GUI to populate a list. At the end of this method we close the executed query and return the resulted list.

```
public List<String[]> getResult(String sparqlQueryString, InfModel infModel, String var1, String var2) {
    Query query = QueryFactory.create(sparqlQueryString);

    QueryExecution qexec = QueryExecutionFactory.create(query, infModel);
    qexec.getContext().set(ARQ.symLogExec, Explain.InfoLevel.ALL);
    ResultSet rs = qexec.execSelect();
    List<String[]> res = new ArrayList<>();

    while(rs.hasNext()){
        String[] rowResult = new String[2];
        QuerySolution row = rs.next();
        rowResult[0] = row.getResource(var1).getURI();
        rowResult[1] = row.getResource(var2).getURI();
        res.add(rowResult);
    }

    qexec.close();
    return res;
}
```

The complete core code is available in Appendix B.5. Another important issue we address is called the distinction between TBox & ABox which stems from a tradition in description logics where one splits *concepts* and their relationships from the different treatment of *instances* and their attributes and roles, expressed as fact assertions. The concept split is known as the TBox and represents the schema or taxonomy of the domain at hand. The TBox is the structural and intensional component of conceptual relationships. It is this construct which we call an *ontology*. The second split of instances is known as the ABox and describes the attributes of instances or individuals, the roles between instances and other assertions about instances regarding their class membership with the TBox concepts. Both the TBox and ABox are consistent with set theoretical principles [Ber09a]. TBox and ABox logic operations differ and their purposes differ. TBox operations are based more on inferencing and tracing or verifying class memberships in the hierarchy, i.e. the structural placement or relation of objects in the structure. ABox operations are more rule-based and govern fact checking, instance checking, consistency checking, and the like. ABox reasoning is generally more complex and at a larger scale than TBox reasoning. We show the difference and interactions between both concepts in Table 4.3.

As Table 4.3 shows, the TBox is where the reasoning work occurs, the ABox is where assertions and data integrity [JP11] occurs, and knowledge base work in the middle, i.e. among other aspects, requires both. This split is also being made in our proof of concept, as the ABox is represented by TDB, and the TBox is the actual camera ontology with its SWRL rules.

Table 4.3: TBox versus ABox.

TBox	TBox ↔ ABox Interactions	ABox
Definitions of the concepts and properties, i.e. relationships, of the controlled vocabulary.	Entailments, which are whether other propositions are implied by the stated condition.	Membership assertions, either as concepts or as roles.
Declarations of concept axioms or roles.	Instance checking, which verifies whether a given individual is an instance of, i.e. belongs to, a specified concept.	Attributes assertions.
Inferencing of relationships, be they transitive, symmetric, functional or inverse to another property.	Knowledge base consistency, which is to verify whether all concepts admit at least one individual.	Linkages assertions that capture the above but also assert the external sources for these assignments.
Equivalence testing as to whether two classes or properties are equivalent to one another.	Realization, which is to find the most specific concept for an individual object.	Consistency checking of instances.
Subsumption, which is checking whether one concept is more general than another.	Retrieval, which is to find the individuals that are instances of a given concept.	Satisfiability checks, which are that the conditions of instance membership are met.
Satisfiability, which is the problem of checking whether a concept has been defined, i.e. is not an empty concept.	Identity relations, which is to determine the equivalence or relatedness of instances in different datasets.	
Classification, which places a new concept in the proper place in a taxonomic hierarchy of concepts.	Disambiguation, which is resolving references to the proper instance.	
Logical implication, which is whether a generic relationship is a logical consequence of the declarations in the TBox.		
Infer property assertions implicit through the transitive property.		

CHAPTER 5

Discussion & Future Work

Introduction;
Discussion;
Future Work

"The key in business is to know
something that nobody else knows."

Aristotle Onassis (⋆ 1906 – 1975 †)

5.1 Introduction

We discuss various issues that came to light in the previous chapters which need to be addressed separately. We debate the differences in annotation support among vendors, an alternative to Jena called Sesame, and we compare different semantic reasoners. Associated with these issues are the limitations of our work and the possible future extensions.

5.2 Discussion

During our annotation analysis we noted that several vendors could improve their annotations. Especially Leica and Olympus since they do not employ any annotations. Furthermore we see that only http://schema.org/WebPage and some properties of OGP like image, title, url, site_name and description are widely supported. Sony performs best in its annotations and the other vendors could take their annotations as an example of how they should employ basic annotations. We also noted that Samsung uses the deprecated annotation of http://data-vocabulary.org/Product which is surpassed by schema.org in June 2011. They should invest in updating their site to link to http://schema.org/Product instead. From our analysis we see two clear schemas as the winners: schema.org and OGP. Our advice would be to use either one of them as basis for website annotations, but if you need to choose between them, we would advice schema.org. It has the benefit of being actively developed and it has the support of major players like Google. OGP on the other hand was developed by Facebook. They seem to leave its development up to the users as they can extend the basic schema at will. Because there is no driving force behind the project, it seems that recent development has stalled.

When we look at what annotations the different vendors use, we notice that only Sony tries to employ a broad spectrum of these basic annotations. But even they can still improve, and when one looks at the different annotations schema.org offers we notice that there are several other annotations applicable to their website. E.g., the properties brand, width, depth, height, model, Manufacturer Part Number (MPN), or SKU which are currently unsupported. However, since most other vendors only support a handful of annotations they are clearly the best in this group of vendors.

In Section 3.6 and Section 4.5 we stated that we use Jena TDB as our triplestore. Of course there are other triplestores on the market, each with there own set of features. Remember that we opted the use of Jena because of its compatibility with our tools, e.g. the Pellet reasoner. Another popular choice is called Sesame [BKvH02]. Sesame is an open source framework for storage, inferencing and querying of RDF data. It is a library that is release under the Aduna BSD-style license and can be integrated in any Java application. Additionally, it is possible to deploy Sesame as an RDF repository and query service. Sesame includes RDF parsers and writers (Sesame Rio), a storage and inference layer (SAIL API) that abstracts from storage and inference details, a repository API for handling RDF data, and an HTTP Server for accessing Sesame repositories via HTTP. It operates in any Java-supporting environment and can be used by any Java application. Sesame also supports many plugins and provides a native as well as a relational backed triple storage. The latter follows a generic triple table layout. In Table 5.1, we give a comparative overview of features between Jena and Sesame [Fra12] as of May 1, 2012.

As mentioned in Section 3.6, there exist many other reasoners beside the Pellet reasoner that we use in our proof of concept application. Over the last ten years, there was a lot of research done creating and comparing several semantic OWL reasoners [Abb12; DCtTdK11]. Here, we want to show some of the features provided by alternative reasoners. Remember that we opted to use Pellet since it is both compatible with Jena and it supports SWRL rules. The following reasoners are being compared:

Table 5.1: Sesame & Jena Feature Comparison.

Feature	Sesame 2.6.5	Jena 2.7.0
Since	2004	2000
License	BSD	Apache
Updated regularly	Yes	Yes
Inputs/outputs		
Input/output formats RDF/XML, N3, Turtle, N-Triples	Yes	Yes
Input/output TriG, TriX	Yes	No
RDF/XML-ABBREV output	No	Yes
SPARQL		
Query in SPARQL 1.0	Yes	Yes
Query in SPARQL 1.1	Yes	Yes
SPARQL Update	Yes	Yes
Other query languages supported?	SeRQL	No
Creating SPARQL queries programmatically	Yes (via org.openrdf.query.parser.sparql.ast)	Yes (module ARQ)
SPARQL Server	Yes (from base through the Sesame server)	Yes (module Fuseki)
Command line utility to run a SPARQL query	Yes, via the command `console`	Yes
Indexing full-text of the RDF by Lucene graph database	No, but possible using Ali Baba or the LuceneSail extension	Yes, module LARQ
RDF Management		
The RDF in memory management	Yes	Yes
Storing RDF in a relational database	Yes	Yes (module SDB)
Storing RDF in binary files	Yes (Native RDF repository)	Yes (module TDB)
Support of named graphs	Yes	Yes
Transaction support (commit, rollback)	Yes	Yes
Setting of RDF graphs via a configuration file	No	Yes (module Assembler)
Inference		
Native RDFS inference	Yes	Yes
Inference OWL-Lite native	No, but possible using GraphDB [BKO+11]	Yes
OWL DL inference	No, but possible using GraphDB	No, but possible by connecting to the Pellet reasoner
Rule-based inference	No, but possible using GraphDB	Yes
OWL		
OWL and RDFS manipulation API: manipulation of classes, properties, domain, ranges, restrictions, etc.	No	Yes, native
Administration		
Administration user interface: create an RDF storage, add data, navigate, etc.	Yes (sesame-workbench)	No
Various		
Listener Mechanism to monitor events on RDF	Yes	Yes
Generation of Java constants from an ontology files	No, but possible using Ali-Baba	Yes (module schemagen)
RDF data-checking tool	No	Yes (module eyeball)

Pellet is an open source java based OWL DL reasoner developed by The Mind Swap group. It is based on the tableau algorithm and supports expressive description logics. It is the first reasoner that supported all of OWL DL $\mathcal{SHOIN}^{(D)}$ and has been extended to OWL2 ($\mathcal{SROIQ}^{(D)}$) [SPC+07]. Pellet supports OWL2 profiles. It reasons ontologies through Jena as well as OWL-API interfaces. Pellet also supports the explanation of bugs, e.g. inconsistencies.

RACER (Renamed ABoxes and Concept Expression Reasoner) is developed a reasoning model. RACER, also known as RacerPro, is the first OWL reasoner. It supports the optimization techniques of FaCT as well as the new optimization techniques for dealing with number restrictions and ABoxes. RACER implements TBox and ABox reasoner for the $\mathcal{SHIQ}$ logic [HHMW12].

FaCT++ (Fast Classification of Terminologies). It can be used as a description logic classifier and for modal logic satisfiability testing. The FaCT system has sound and complete tableaux algorithm for expressive description logics. An updated version of FaCT is FaCT++. This reasoner uses the same algorithm as in FaCT, but with a different internal structure. It is implemented in C++. The first version of the FaCT++ was only supporting the reasoning in $\mathcal{SHOIQ}$, OWL DL. However, the latest version of FaCT++ supports OWL and is based on the description logic $\mathcal{SROIQ}$. FaCT++ implements a tableau-based decision procedure for general TBoxes and incomplete support for ABoxes [TH06].

Snorocket is a high-performance implementation of the polynomial-time classification algorithm for the lightweight Description Logic $\mathcal{EL}+$. It is implemented in Java. Snorocket has been developed as part of the CSIRO's Health Informatics and Clinical Terminologies research program [ML13].

SWRL-IQ (Semantic Web Rule Language Inference and Query tool) is a plugin for Prot'eg'e that allows users to edit, save, and submit queries to an underlying inference engine based on XSB Prolog [Ele12]. The tool has number of features:

- Goal-oriented backward-chaining Prolog-style reasoning.
- Tracing and debugging inference results.
- Saving queries.
- Exporting query results in XML or CSV format.
- No dependency on proprietary or closed-source components.
- Uses XSB Prolog, which is freely available under the LGPL license.

ELK is a free and open source reasoner for the lightweight ontology language OWL2 EL. The ELK reasoner is based on Java and can be controlled using the OWL API. ELK is available under the Apache License 2.0. It runs in all operating systems that support Java 1.5 or above [KKS12].

HermiT is the first publicly available OWL reasoner. It is written using OWL. HermiT can check the OWL files to determine the consistency of the ontologies and to identify the hierarchical relationships between the classes. This reasoner is based upon the hypertableau calculus. It also provides the faster process for classifying the ontologies [GHM+14; HMW12; SMH08].

CEL (Classifier for *el+*) is a LISP based reasoner. It has very simple shell like interface. It provides users with all essential functionalities including a simple interactive help command. CEL is based on the refined version of polynomial-time classification algorithm. It mainly provides the classification reasoning services involving the computation of the complete subsumption hierarchy between all concept names occurring in the input ontology.

TrOWL (Tractable OWL2 infrastructure) is the common interface to a number of reasoners developed in Aberdeen University. TrOWL Quill provides reasoning services over OWL2 QL. TrOWL REL is an optimized implementation of the CEL algorithm that provides reasoning over OWL2 EL. To support full DL reasoning, TrOWL allows for the use of heavy weight plugin reasoners,

such as FaCT++, Pellet, HermiT and RacerPro. The current study observed that all the above reasoners can be used with protégé and NeOn toolkit [EW12]. But the reasoners are not compatible with all the versions of protégé [TPR10].

After a detailed study on ontology reasoners, we present a comparison of ontology reasoners with respect to their attributes. This comparison is shown in Table 5.2. From this comparison, we learn that reasoners vary significantly with respect to all included reasoner attributes. A critical estimation and evaluation of requirements is thus needed before selecting a reasoner for a real-life application.

Table 5.2: Comparison of Reasoners.

	Pellet	RACER	FACT++	Snorocket	SWRL-IQ	HermiT	CEL	TrOWL	ELK
Methodology	Tableau Based	Tableaux Based	Tableau Based	Completion Rules	SWRL Rules	Hypertableau Based	Completion Rules	Completion Rules	Consequence Based
Soundness	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completeness	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Expressivity	$\mathcal{SROIQ}^{(D)}$	$\mathcal{SHIQ}$	$\mathcal{SROIQ}^{(D)}$	$\mathcal{EL}+$	-	$\mathcal{SROIQ}^{(D)}$	$\mathcal{EL}+$	$\mathcal{SROIQ}$	$\mathcal{EL}$
Native Profile	DL, EL	DL	DL	EL	-	DL	EL	DL, EL	EL
Incremental Classification: Addition	Yes	No	No	Yes	Yes/No	No	Yes	No	Yes
Incremental Classification: Removal	Yes	No	No	No	Yes/No	No	No	No	Yes
Rule Support	Yes (SWRL)	Yes (SWRL)	No	No	Yes (SWRL)	Yes (SWRL)	No	No	Yes (Own rule format)
Platforms	All	All	All	All	All	All	Linux	All	All
Justifications	Yes	Yes	No	No	Yes	No	Yes	No	No
ABox Reasoning	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
OWL API	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
OWL Link API	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes/No
Protégé Support	Yes	Yes	Yes	Yes	Yes (Protégé 3.4.x)	Yes	Yes	Yes	Yes
NeOn Support	Yes	No	No	No	No	Yes	No	No	No
License	DULI: AGPL	Own	GLGPL	Own	Yes/No	GLGPL	Apache License 2.0	DULI: AGPL	Apache License 2.0
Jena Support	Yes	No	No	No	No	No	No	Yes	Yes/No
Implementation Language	Java	LISP	C++	Java	Prolog	Java	LISP	Java	Java
Availability	Open Source	Commercial	Open Source	Commercial	Yes/No	Open Source	Open Source	Commercial	Open Source

5.3 Future Work

During our work on the project, we did not run into any real limitations. As our work consists of a proof of concept, and is thereby limited in size, we cannot foresee all problems one could run into when transforming this application into a real-world solution. We can however talk about some of the future work that lies ahead. First we should validate our work on the ontology, property by property. This process should occur first within Sony so that we can work out any shortcomings. Next we should offer the competitors a change to pitch in and provide their view on the work. As a result, our ontology will probably be altered to reflect the viewpoints of the competitors. When both this internal and external validation is done, we can propose our ontology as an industry standard. Additionally, we should test our ontology against the entire dataset of camera features at the disposal of Sony. This process involves mapping the entire database to RDF triples and storing them into a triplestore. Because this undertaking is time consuming both in man hours and in computing power, we could not test that ourselves. At that time, we could also perform some performance test in order to verify whether our approach is feasible in the real world. If this test is successful, we can start developing a real application which is tailored to the specific business needs of our partner.

Other areas of future work include extending the ontology to other related electronics. E.g., it would be interesting to know which television can display pictures or movies made using a specific camera. Another possibility is the inclusion of broadcast cameras into the ontology. As we only looked at cameras intended for the consumer or professional photographer, the inclusion of such devices can broaden the scope of our product. But in all honesty, the real specification of future work should come

from our partner, Sony, as they have the best knowledge about the domain.

CHAPTER 6

Conclusion

Thesis Conclusion

"As this whole volume is one long argument, it may be convenient to the reader to have the leading facts and inferences briefly recapitulated." [see Dar59, p. 459]

Charles Darwin (⋆ 1809 – 1882 †)

6.1 Thesis Conclusion

In Chapter 1 contains a problem description in which we explain the problem setting of this master's thesis. We explain the business question with which our partner, Sony, contacted us. The research methodology for our work is also explained in this chapter as we employ "design science". At last an overview of the content of this master's thesis is provided.

Chapter 2 provides a description of the domain on which we apply the business question. Here, we explain the domain of digital photography. We elaborate on specific camera terminology in order to introduce the domain. Both the concept of ontology and various ontology creation tools are introduced. Next we introduce the concept of SWRL reasoning. We conclude the chapter with a thorough overview of the related work in our domain. This related work includes both existing ontologies and schemas on one hand, and generic related research on the other.

Chapter 3 serves as an overview of our solution approach. We start by giving a general solution approach and then we explain in detail the steps necessary to create our solution. These steps include a study of the annotated data, and a proper domain analysis. We focus on the data processing as this will become an important part of our solution. Finally, we explain the end goal of this master's thesis, i.e. a proof of concept application.

Chapter 4 describes an implementation of the solution strategy provided in Chapter 3. We describe the results of our annotation study by means of a statistical analysis. A highlevel overview is given of our ontology in which we describe the different pillars on which the product has been build. Next, the concrete SWRL rules for our domain are presented. We conclude our implementation chapter by describing our proof of concept application.

In Chapter 5, we discuss some open issues gathered throughout the master's thesis. We end our research by describing some future enhancements to our work.

Appendices

APPENDIX A

Tools

eClassOWL Documentation Generator;
Log4j 1.2 Configuration;
Log4j 2 Configuration;
eClassOWL Documentation Extractor;
Getschema.org Webservice Consumer;
Annotation Extractor Driver Program

A.1 eClassOWL Documentation Generator

Listing A.1: Transform.java.

Transform.java

```
package be.ac.vub.wise.stroobants.pieter.masterthesis;

import java.io.*;
import java.nio.file.Paths;
import java.util.List;
import java.util.Arrays;
import java.util.ArrayList;
import java.util.ListIterator;

import javax.swing.JFileChooser;
import javax.swing.JOptionPane;
import javax.swing.UIManager;
import javax.swing.UnsupportedLookAndFeelException;
import javax.swing.filechooser.FileNameExtensionFilter;

import org.apache.commons.csv.CSVPrinter;
import org.apache.commons.csv.CSVParser;
import org.apache.commons.csv.CSVFormat;
import org.apache.commons.csv.CSVRecord;
import org.apache.logging.log4j.LogManager;
import org.apache.logging.log4j.Logger;

import org.jdom2.Document;
import org.jdom2.Element;
import org.jdom2.JDOMException;
import org.jdom2.input.SAXBuilder;
import org.jdom2.output.Format;
import org.jdom2.output.XMLOutputter;

import com.jgoodies.looks.plastic.PlasticLookAndFeel;
import org.jdom2.input.sax.XMLReaderSAX2Factory;

/**
 * <p>
 * Transform Application written in Java SE 7.
 * </p>
 *
 * <p>
 * This application is written to convert the html file provided by the ecl@ss
 * ontology into readable CSV files. The application has been tested against the
 * ecl@ss 5.1.4 documentation. We allow the user to convert the entire file into
 * four CSV files or to select the portion of interest. These choices are:
 *
 * <ul>
 * <li>Classes</li>
 * <li>Datatype Properties</li>
 * <li>Object Properties</li>
 * <li>Instance Data: Enumerated Data Types</li>
 * </ul>
 * </p>
 *
 * <p>
 * Note that this last option results in an empty file since at the time of
 * writing ecl@ss version 5.1.4 does not offer instance data. This choice will
 * be offered to the user during the execution the program by means of dialog.
 * For the sake of performance the previously converted file is stored on disk
 * in its internal java representation. Beware however that the program takes
 * several minutes to complete its work. On our test machine this process took
 * up to ten minutes. The resulting CSV (comma separated values) files can be
 * read into e.g. Microsoft Excel or OpenOffice Calc for further processing.
 *
 * <br/>
 * ----------------------------------------------------------
 * <br/>
 * </p>
 *
 * <p>
 * WARNING: Running this program on the ecl@ss HTML file can take up to 10min
 * (at least on the developers machine)
 *
 * To speed this process up you can cut out of the file the the tables in which
 * you have no interest in. By reducing the file size you dramatically reduce
 * the processing time.
 *
```

```
 * This limitation comes from the fact that the JDom API transforms the entire
 * file into a DOM Tree consisting of lists of elements and since the source
 * file is huge this process takes up a lot of time.
 *
 * <br/>
 * ------------------------------------------------------
 * <br/>
 * </p>
 *
 * <p>
 * Version history:
 * <ul>
 * <li>version 1.00 (2013-12-19): Initial Version</li>
 * <li>version 2.00 (2014-01-03): Implemented Performance Enhancements</li>
 * <li>version 2.01 (2014-01-07): Bug fixes</li>
 * <li>version 3.00 (2014-01-13): Added post-processing for Classes</li>
 * </ul>
 *
 * <br/>
 * ------------------------------------------------------
 * <br/>
 *
 * @author
 * <a href="mailto:pstrooba@vub.ac.be?subject=Transform%20Application">Pieter
 * Stroobants</a>
 * @version 3.00 (2014-01-13)
 * </p>
 */
public class Transform {

  /**
   * <p>
   * The current class. For convenience saved in a variable so that when the
   * class name changes, all properties depending on this name also change
   * accordingly.
   * </p>
   */
  private static final Class<?> currentClass = new Object() {
  }.getClass().getEnclosingClass();

  /**
   * <p>
   * The string that indicates that the current record is a generic one.
   * </p>
   */
  private static final String genericRecordID = " [Generic Concept: This type of goods]";

  /**
   * <p>
   * The string that indicates that the current record is a taxonomy one.
   * </p>
   */
  private static final String taxonomyRecordID = " [Taxonomy Concept: Anything that may be an instance of this category in any
  ↪    context]";

  /**
   * <p>
   * The internal representation of a XML File.
   * </p>
   */
  private static Document eclass, settings;

  /**
   * <p>
   * The number of delimiters on a normal "generic" record.
   * Note: This is the number on which the header is based.
   * Luckily there are only a few records that are exceptional in the sense that
   * they are too short (i.e. too little delimiters). They all lack a value for
   * a certain attribute. This issue gets resolved by means of an empty column
   * i.e. the insertion of an extra delimiter.
   * </p>
   */
  private static final byte genericNormalNumberOfColumns = 5;

  /**
   * <p>
   * The file that was loaded the previous time i.e. the last time the
   * application has run.
   * </p>
```

```
     */
    private static File lastFileLoaded;

    /**
     * <p>
     * Our Log4j logger.
     * </p>
     */
    private static Logger logger;

    /**
     * <p>
     * The number of columns on a normal "taxonomy" record.
     * Note: This is the number on which the header is based.
     * Luckily there are only a few records that are exceptional in the sense that
     * they are too short (i.e. too little delimiters). They all lack a value for
     * a certain attribute. This issue gets resolved by means of an empty column
     * i.e. the insertion of an extra delimiter.
     * </p>
     */
    private static final byte taxonomyNormalNumberOfColumns = 6;

    /**
     * <p>
     * The header type of the classes you want to process. The choices are:
     * <ul>
     * <li>Taxonomy</li>
     * <li>Generic</li>
     * </ul>
     * </p>
     */
    private static enum ClassHeaderType {

      TAXONOMY, GENERIC;
    }

    /**
     * <p>
     * main method of the Transform Application. Beware that this application does
     * not use any argument that is passed on the command line as an application
     * argument!
     * </p>
     *
     * @param args Unused by the application.
     */
    public static void main(String[] args) {
      try {
        setupProgram();
        loadXML();
        loadFile();
        processing(askForTablesToProcess());
        saveXML();
        System.exit(0);
      } catch (UnsupportedLookAndFeelException | JDOMException | IOException | ClassNotFoundException e) {
        logger.error(Arrays.toString(e.getStackTrace()));
      }
    }

    /**
     * <p>
     * setupProgram sets up two program settings. First it sets the UI style to
     * the <code>PlasticLookAndFeel</code> from JGoodies. Second it configures the
     * logger for the application using the log4j library and a XML configuration
     * file.
     * </p>
     *
     * @throws UnsupportedLookAndFeelException Thrown when the
     * <code>PlasticLookAndFeel</code> is not supported by system you are running
     * the code on.
     * @since 2.00
     */
    private static void setupProgram() throws UnsupportedLookAndFeelException {
      UIManager.setLookAndFeel(new PlasticLookAndFeel());
      logger = LogManager.getLogger(currentClass);
      logger.info("The Logger has been set up");
    }

    /**
     * <p>
```

```
     * Reads the value of the last file loaded into the program from the
     * <code>Transform.xml</code> file. This method, together with the changes in
     * the method <code>loadFile()</code>, is written to enhance the performance
235  * of the application when processing the full (69.5Mb ecl@ss HTML) file.
     * </p>
     *
     * @throws JDOMException When an error occurs in the SAXBuilder class when
     * reading in the ecl@ss HTML file.
240  * @throws IOException When a general input/output errors occurs.
     * @throws ClassNotFoundException Thrown by e.g. FileOutputStream if the file
     * exists but is a directory rather than a regular file, does not exist but
     * cannot be created, or cannot be opened for any other reason.
     * @since 2.00
245  */
    private static void loadXML() throws JDOMException, IOException, ClassNotFoundException {
      logger.info("Loading XML Settings");
      settings = new SAXBuilder().build(currentClass.getSimpleName() + ".xml");
      lastFileLoaded = (settings.getRootElement().getChildText("lfl").isEmpty() ? Paths.get(".").toFile().getCanonicalFile() : new
    ↪   File(settings.getRootElement().getChildText("lfl")));
250 }

    /**
     * <p>
     * loadFile asks the user to specify the ecl@ss HTML file that it needs to
255  * process. If that specific file has been selected before it will ask the
     * user to process a cached version or reload the file from disk. When you
     * load the entire file (around 69.5Mb) at once, loading the previously cached
     * version saves around 3 minutes on the execution time of the program. This
     * method contains the performance bottleneck of the application. On the other
260  * hand, you only need to run this program once to get all CVS files.
     * </p>
     *
     * @throws JDOMException When an error occurs in the SAXBuilder class when
     * reading in the ecl@ss HTML file.
265  * @throws IOException When a general input/output errors occurs.
     * @throws ClassNotFoundException Thrown by e.g. FileOutputStream if the file
     * exists but is a directory rather than a regular file, does not exist but
     * cannot be created, or cannot be opened for any other reason.
     * @see #main(String[] args)
270  */
    @SuppressWarnings("empty-statement")
    private static void loadFile() throws JDOMException, IOException, ClassNotFoundException {
      logger.info("Loading Selected File");
      JFileChooser jfc = new JFileChooser(Paths.get(".").toFile().getCanonicalFile()); // or new File(".")
275   jfc.setFileFilter(new FileNameExtensionFilter("HTML Files", "html"));
      while (jfc.showOpenDialog(null) != JFileChooser.APPROVE_OPTION)
              ;
      if (jfc.getSelectedFile().getPath().equals(lastFileLoaded.getPath()) && new File(currentClass.getSimpleName() +
    ↪   ".lfl").exists()) {
        int response = JOptionPane.showConfirmDialog(null, "Do you want to load this file from cache?", "Use cached version",
    ↪    JOptionPane.YES_NO_OPTION, JOptionPane.QUESTION_MESSAGE);
280     if (response == JOptionPane.YES_OPTION) {
          logger.info("Loading Cached Version of File: " + jfc.getSelectedFile().getPath());
          try (ObjectInputStream ois = new ObjectInputStream(new FileInputStream(currentClass.getSimpleName() + ".lfl"))) {
            eclass = (Document) ois.readObject();
          }
285     } else {
          logger.info("A cached version of File: " + jfc.getSelectedFile().getPath() + " exists, but loading from disk instead");
          eclass = new SAXBuilder(new XMLReaderSAX2Factory(false, "com.bluecast.xml.Piccolo")).build(jfc.getSelectedFile());
          try (ObjectOutputStream oos = new ObjectOutputStream(new FileOutputStream(currentClass.getSimpleName() + ".lfl"))) {
            oos.writeObject(eclass);
290         oos.flush();
          }
        }
      } else {
        logger.info("Loading File: " + jfc.getSelectedFile().getPath() + " from disk");
295     eclass = new SAXBuilder(new XMLReaderSAX2Factory(false, "com.bluecast.xml.Piccolo")).build(jfc.getSelectedFile());
        try (ObjectOutputStream oos = new ObjectOutputStream(new FileOutputStream(currentClass.getSimpleName() + ".lfl"))) {
          oos.writeObject(eclass);
          oos.flush();
        }
300     logger.info("Last file loaded has been updated to: " + jfc.getSelectedFile().getPath());
        lastFileLoaded = jfc.getSelectedFile();
      }
    }

305 /**
     * <p>
     * getTablesToProcess searches for all tables that it can process and asks the
```

```
     * user which tables he/she wants to process.
     * </p>
     *
     * @return a list of Strings containing all table names to process.
     * @see #getAllTableNames()
     */
    @SuppressWarnings("empty-statement")
    private static String[] askForTablesToProcess() {
      logger.info("Specifying which Tables to Process");
      String[] tables = getAllTableNames();
      String[] options = new String[]{"Entire File", "Select Table"};
      int response = JOptionPane.showOptionDialog(null, "Do you want to process the entire file or select a specific table?",
    ↪   "What do you want to do?", JOptionPane.YES_NO_OPTION, JOptionPane.QUESTION_MESSAGE, null, options, options[0]);
      if (response == JOptionPane.NO_OPTION) {
        String table;
        while ((table = (String) JOptionPane.showInputDialog(null, "What do you want to process?", "Select Processing Table",
    ↪   JOptionPane.PLAIN_MESSAGE, null, tables, tables[0])) == null);
        tables = new String[]{table};
      }
      return tables;
    }

    /**
     * <p>
     * getAllTableNames retrieves a list of all table names in the ecl@ss HTML
     * file.
     * </p>
     *
     * @return a list of Strings containing all table names in the ecl@ss HTML
     * file.
     */
    private static String[] getAllTableNames() {
      ListIterator<Element> bodylist = eclass.getRootElement().getChild("body",
    ↪   eclass.getRootElement().getNamespace()).getChildren().listIterator();
      Element idcontainer = null;
      while (bodylist.hasNext()) {
        Element div = bodylist.next();
        String attributevalue = div.getAttributeValue("id");
        if (attributevalue != null && attributevalue.equals("container")) {
          idcontainer = div;
        }
      }
      ListIterator<Element> htwochildren = idcontainer.getChildren("h2", eclass.getRootElement().getNamespace()).listIterator();
      ListIterator<Element> hthreechildren = idcontainer.getChildren("h3", eclass.getRootElement().getNamespace()).listIterator();
      ArrayList<String> proctables = new ArrayList<>();
      while (htwochildren.hasNext()) {
        Element child = htwochildren.next();
        if (child.getChildTextNormalize("a", eclass.getRootElement().getNamespace()).equals("Properties")) {
          while (hthreechildren.hasNext()) {
            proctables.add(hthreechildren.next().getChildTextNormalize("a", eclass.getRootElement().getNamespace()));
          }
        } else {
          proctables.add(child.getChildTextNormalize("a", eclass.getRootElement().getNamespace()));
        }
      }
      return proctables.toArray(new String[proctables.size()]);
    }

    /**
     * <p>
     * processing is the main loop that will process each table given an array of
     * table names.
     * </p>
     *
     * @param tables The tables that need to be converted.
     * @throws FileNotFoundException Thrown by PrintWriter when the given string
     * does not denote an existing, writable regular file and a new regular file
     * of that name cannot be created, or if some other error occurs while opening
     * or creating the file.
     * @throws IOException General exception thrown when an input/output error
     * occurs.
     */
    private static void processing(String[] tables) throws FileNotFoundException, IOException {
      if (tables != null) {
        logger.info("Processing " + tables.length + " table" + (tables.length > 1 ? "s" : ""));
        for (String table : tables) {
          logger.info("Processing: " + table);
          String outfile = lastFileLoaded.getName().substring(0, lastFileLoaded.getName().lastIndexOf(".")) + "_" +
    ↪   table.toLowerCase().replace(" ", "_").replace(":", "") + ".csv";
```

```
      File printFile = new File(lastFileLoaded.getParentFile().getPath() + File.separator + outfile);
      if (!printFile.exists()) {
        printFile.createNewFile();
      }
      Element processTable = getTable(table);
      if (!table.equalsIgnoreCase("Classes")) {
        logger.info("Printing Header: " + table);
        printHeader(printFile, processTable);
        logger.info("Transforming: " + table);
        transform(printFile, processTable, true);
      } else {
        logger.info("Transforming: " + table);
        transform(printFile, processTable, false);
        postProcessClasses(printFile, processTable);
        printFile.delete();
      }
    }
  }
}

/**
 * <p>
 * getTable searches the table in the ecl@ss document belonging to the
 * specified heading argument. If no such table is found <code>null</code> is
 * returned.
 * </p>
 *
 * @param heading The String containing the header of which we need to find
 * the according table.
 * @return The table in the form of an <code>Element</code> belonging to the
 * heading.
 */
private static Element getTable(String heading) {
  ListIterator<Element> bodylist = eclass.getRootElement().getChild("body",
↪    eclass.getRootElement().getNamespace()).getChildren("div", eclass.getRootElement().getNamespace()).listIterator();
  Element table = null, idcontainer = null;
  while (bodylist.hasNext()) {
    Element div = bodylist.next();
    String attributevalue = div.getAttributeValue("id");
    if (attributevalue != null && attributevalue.equals("container")) {
      idcontainer = div;
    }
  }
  if (idcontainer != null) {
    ListIterator<Element> containerchildren = idcontainer.getChildren().listIterator();
    while (containerchildren.hasNext()) {
      Element child = containerchildren.next();
      if (child.getName().equals("h2") || child.getName().equals("h3")) {
        String headingtext = child.getChildTextNormalize("a", eclass.getRootElement().getNamespace());
        if (headingtext.equalsIgnoreCase(heading)) {
          Element checkForTable = containerchildren.next();
          while (!checkForTable.getName().equals("table")) {
            checkForTable = containerchildren.next();
          }
          table = checkForTable;
        }
      }
    }
  }
  return table;
}

/**
 * <p>
 * printHeader will print a header of the specified <code>table</code> and
 * writes the result to the given <code>pw</code>. This method will output
 * this result in CVS (comma separated value) format. Beware that this method
 * does not work for table <code>Classes</code> since that table uses a
 * different encoding schema for taxonomy and generic records. Even when we
 * try to split these cases into different files we see that the used encoding
 * is not even consistent within one category e.g. a taxonomy will refer to
 * the higher concept of which it inherits its properties, but a the top level
 * of each category we see a field popping up called category code which
 * denotes some internal reference to that taxonomy class. Since all these
 * records (technically rows in the table) sometimes have the same amount of
 * attributes, but sometimes have a different number of attributes it is too
 * difficult and beyond the scope of this program to recognize and process
 * each case for the table <code>Classes</code>. We opt for the approach to
 * output a consistent amount of the String <code>delimiter</code> to ensure
```

```
     * further processing abilities in tools that support CVS files and leave it
     * up to the user to determine the meaning of each attribute in a particular
     * row. All other tables, more concrete the two property tables will output a
     * consistent header. This is done by taking constructing the header from the
     * first record in the table.
     * </p>
     *
     * @param printFile The file to which we need to write our processed header.
     * @param table The table that contains the header information that needs to
     * be processed.
     * @throws IOException General exception thrown when an input/output error
     * occurs.
     * @see #transform(File printFile, Element table)
     */
    private static void printHeader(File printFile, Element table) throws IOException {
      if (printFile != null && table != null && printFile.isFile() && printFile.canWrite()) {
        try (CSVPrinter csvp = new CSVPrinter(new FileWriter(printFile, false), CSVFormat.RFC4180)) {
          ListIterator<Element> li = table.getChildren().listIterator();
          if (li.hasNext()) {
            Element row = li.next();
            while (li.hasNext() && (row.getChildren().size() > 1)) {
              csvp.print(row.getChildren().get(0).getTextNormalize().substring(0,
    ↪   row.getChildren().get(0).getTextNormalize().lastIndexOf(":")));
              row = li.next();
            }
          }
          csvp.println();
          csvp.flush();
        }
      }
    }

    /**
     * <p>
     * transform will convert the specified <code>table</code> and writes the
     * result to the given <code>pw</code>. This method will output the result in
     * CVS (comma separated value) format. Because different tables use a
     * different way to encode the information, we need to resolve these
     * differences. In the code we explain the three basic possibilities of where
     * the requested information can be found in the file. As explained in the
     * comment for the method
     * <code>printHeader(PrintWriter pw, Element table)</code> in the case of the
     * table <code>Classes</code> we will simple output all information and
     * produce a consistent amount of <code>delimiter</code>s so that the
     * resulting file can be processed by CVS capable tools.
     * </p>
     *
     * @param printFile The file to which we need to write our processed records.
     * @param table The table that we need to process.
     * @param append Either append to the printFile or overwrite it.
     * @throws IOException General exception thrown when an input/output error
     * occurs.
     */
    private static void transform(File printFile, Element table, boolean append) throws IOException {
      if (printFile != null && table != null && printFile.isFile() && printFile.canWrite()) {
        try (CSVPrinter csvp = new CSVPrinter(new FileWriter(printFile, append), CSVFormat.RFC4180)) {
          ListIterator<Element> attributelist = table.getChildren().listIterator();
          while (attributelist.hasNext()) {
            List<Element> values = attributelist.next().getChildren("td", eclass.getRootElement().getNamespace());

            /*
             * <p>
             * Possibility One: tr has one child with no
             * information (used as a spacer/separator between
             * entries). When we encounter this case, we know that
             * we processed a record, so we print a newline.
             * </p>
             */
            if (values.size() < 2) {
              csvp.println();

            /*
             * <p>
             * Possibility Two: We find the text directly
             * under the tag <code><td></code> Originally this
             * possibility was implemented as a
             * <code>else if</code> statement, but for
             * performance reasons this is re-implemented as a
             * <code>else</code> block in which we process
```

```
          * <code>values.get(1).getTextNormalize ()</code>
          * only once. Inside the HTML file we can detect
          * if we need to go one level deeper by compairing
          * the normalized contents against the string ",".
          * </p>
          */
         } else {
           String td = values.get(1).getTextNormalize();
           if (!td.isEmpty() && !td.equals(",")) {
             csvp.print(td);

           /*
            * <p>
            * Possibility Three: We have to go one or two
            * level(s) deeper, respectively:
            * <ul>
            * <li>One level in the <code><a></code> element</li>
            * <li>Two levels in the <code><b><a></code>
            * element</li>
            * </ul>
            * </p>
            */
           } else {
             String output = (values.get(1).getChild("b", eclass.getRootElement().getNamespace()) == null ?
    values.get(1).getChildTextNormalize("a", eclass.getRootElement().getNamespace()) : values.get(1).getChild("b",
    eclass.getRootElement().getNamespace()).getChildTextNormalize("a", eclass.getRootElement().getNamespace()));
             csvp.print(output);
           }
         }
       }
       csvp.flush();
     }
   }
 }

 /**
  * <p>
  * postProcessClasses does the post-processing of Classes by converting the
  * raw records written by the Transform method into both taxonomy and generic
  * records. This post-processing occurs by splitting the input file into two
  * distinct output files each containing one type of record. Before writing
  * the records we first write a header row like other tables.
  * </p>
  *
  * @param classFile The file containing the raw processed classes.
  * @param table The table that we need to process.
  * @throws FileNotFoundException Thrown by PrintWriter when the given string
  * does not denote an existing, writable regular file and a new regular file
  * of that name cannot be created, or if some other error occurs while opening
  * or creating the file.
  * @throws IOException General exception thrown when an input/output error
  * occurs.
  * @since 3.00
  */
 private static void postProcessClasses(File classFile, Element table) throws FileNotFoundException, IOException {
   if (classFile != null && table != null && classFile.isFile() && classFile.canRead()) {
     logger.info("PostProcessing: " + classFile.toString());
     String basicFileName = classFile.getParentFile().getPath() + File.separator + classFile.getName().substring(0,
    classFile.getName().lastIndexOf("."));
     File genericConcept = new File(basicFileName + "_generic.csv");
     if (!genericConcept.exists()) {
       genericConcept.createNewFile();
     }
     File taxonomyConcept = new File(basicFileName + "_taxonomy.csv");
     if (!taxonomyConcept.exists()) {
       taxonomyConcept.createNewFile();
     }
     logger.info("Writing Header for Generic Classes");
     printClassHeader(genericConcept, table, ClassHeaderType.GENERIC);
     logger.info("Writing Header for Taxonomy Classes");
     printClassHeader(taxonomyConcept, table, ClassHeaderType.TAXONOMY);
     logger.info("Splitting:" + classFile.toString() + " into: " + genericConcept.toString() + " and: " +
    taxonomyConcept.toString());
     splitClassFile(classFile, genericConcept, taxonomyConcept);
   }
 }

 /**
  * <p>
```

```
     * printClassHeader prints a header for the type of class specified by the
     * argument <code>taxonomyClass</code>. When this argument is true, a header
     * for taxonomy is printed. Otherwise a header for generic is printed.
     * </p>
     *
     * @param printFile The File in which the header needs to be printed.
     * @param table The table containing the Classes.
     * @param cht The header type of the classes you want to process. Can be
     * either taxonomy or generic.
     * @throws IOException General exception thrown when an input/output error
     * occurs.
     * @since 3.00
     */
    private static void printClassHeader(File printFile, Element table, ClassHeaderType cht) throws IOException {
      if (printFile != null && table != null && printFile.isFile() && printFile.canWrite()) {
        try (CSVPrinter csvp = new CSVPrinter(new FileWriter(printFile, false), CSVFormat.RFC4180)) {
          ListIterator<Element> li = table.getChildren().listIterator();

          /*
           * Skip an arbitrary number of rows in the hopes of ending up just before
           * a good record. If the header is wrong e.g. a record is used as a header
           * that has too little rows, you need to change this value manually.
           * Remember that we need this technique in order to jump over the first
           * couple of records which suffer from this issue.
           */
          int skip = Byte.MAX_VALUE;
          while (skip > 0 && li.hasNext()) {
            li.next();
            skip--;
          }
          if (li.hasNext()) {

            // Next we position ourselves at the start of the next record.
            List<Element> values = li.next().getChildren("td", eclass.getRootElement().getNamespace());
            while (values.size() != 1 && li.hasNext()) {
              values = li.next().getChildren("td", eclass.getRootElement().getNamespace());
            }

            // Now we can start building up the header.
            ArrayList<String> header = new ArrayList<>();
            StringBuilder content = new StringBuilder();
            boolean continueLookingForHeader = true;
            while (li.hasNext() && continueLookingForHeader) {
              values = li.next().getChildren("td", eclass.getRootElement().getNamespace());
              if (values.size() < 2) {
                if (content.toString().contains(genericRecordID) && cht == ClassHeaderType.GENERIC) {
                  for (String head : header) {
                    csvp.print(head.substring(0, head.length() - 1));
                  }
                  continueLookingForHeader = false;

                  /*
                   * We cannot test on contains(taxonomyRecordID) since not all
                   * taxonomy records contain this identifier.
                   */
                } else if (!content.toString().contains(genericRecordID) && cht == ClassHeaderType.TAXONOMY) {
                  for (String head : header) {
                    csvp.print(head.substring(0, head.length() - 1));
                  }
                  continueLookingForHeader = false;
                } else {
                  content.delete(0, content.length());
                  header.clear();
                }
              } else {
                header.add(values.get(0).getTextNormalize());
                String td = values.get(1).getTextNormalize();
                if (!td.isEmpty()) {
                  content.append(td);
                } else {
                  content.append(values.get(1).getChild("b", eclass.getRootElement().getNamespace()) == null ?
    ↪   values.get(1).getChildTextNormalize("a", eclass.getRootElement().getNamespace()) : values.get(1).getChild("b",
    ↪   eclass.getRootElement().getNamespace()).getChildTextNormalize("a", eclass.getRootElement().getNamespace()));
                }
              }
            }
            csvp.flush();
          }
        }
```

```
    }
  }

  /**
   * <p>
   * splitClassFile splits the input file <code>classFile</code> into two output
   * files named <code>generic</code> for the generic entries and
   * <code>taxonomy</code> for the taxonomy entries.
   * </p>
   *
   * @param classFile The input class file.
   * @param generic The output file for generic entries.
   * @param taxonomy The output file for taxonomy entries.
   * @throws FileNotFoundException Thrown by PrintWriter when the given string
   * does not denote an existing, writable regular file and a new regular file
   * of that name cannot be created, or if some other error occurs while opening
   * or creating the file.
   * @throws IOException General exception thrown when an input/output error
   * occurs.
   * @since 3.00
   */
  private static void splitClassFile(File classFile, File generic, File taxonomy) throws FileNotFoundException, IOException {
    if (classFile != null && generic != null && taxonomy != null
            && classFile.isFile() && classFile.canRead() && generic.isFile()
            && generic.canWrite() && taxonomy.isFile() && taxonomy.canWrite()) {
      try (CSVParser parser = new CSVParser(new FileReader(classFile), CSVFormat.RFC4180);
           CSVPrinter genericConcept = new CSVPrinter(new FileWriter(generic, true), CSVFormat.RFC4180);
           CSVPrinter taxonomyConcept = new CSVPrinter(new FileWriter(taxonomy, true), CSVFormat.RFC4180)) {
        for (CSVRecord csvRecord : parser) {
          if (csvRecord.get(0).contains(genericRecordID)) {
            switch (csvRecord.size()) {
              /*
               * The record is one column short, i.e. eCl@ss 5.1.4 identifier
               * is missing. Warning: We assume that this column has been dropped.
               * If another column has been dropped extra checks have to be
               * implemented here.
               */
              case 4:
                genericConcept.println();
                for (int i = 0; i < csvRecord.size() - 1; i++) {
                  genericConcept.print(i == 0? csvRecord.get(i).replace(genericRecordID, "") : csvRecord.get(i));
                }
                genericConcept.print(null);
                genericConcept.print(csvRecord.get(csvRecord.size() - 1));
                break;

              /*
               * The normal case.
               */
              case genericNormalNumberOfColumns:
                genericConcept.println();
                for (int i = 0; i < csvRecord.size(); i++) {
                  genericConcept.print(i == 0? csvRecord.get(i).replace(genericRecordID, "") : csvRecord.get(i));
                }
                break;

              /*
               * Failsafe error reporting
               */
              default:
                logger.warn("Generic: " + csvRecord.size() + " columns found, should be " + genericNormalNumberOfColumns + ", in
↪   CSVRecord: " + csvRecord.toString());
                break;
            }
          } else {
            switch (csvRecord.size()) {
              /*
               * The record is one column short, i.e. rdfs:subClassOf
               * is missing. Warning: We assume that this column has been dropped.
               * If another column has been dropped extra checks have to be
               * implemented here.
               */
              case 5:
                taxonomyConcept.println();
                for (int i = 0; i < csvRecord.size(); i++) {
                  taxonomyConcept.print(i == 0? csvRecord.get(i).replace(taxonomyRecordID, ""): csvRecord.get(i));
                }
                taxonomyConcept.print(null);
                break;
```

```
770                 /*
                     * The normal case.
                     */
                    case taxonomyNormalNumberOfColumns:
                      taxonomyConcept.println();
775                   for (int i = 0; i < csvRecord.size(); i++) {
                        taxonomyConcept.print(i == 0? csvRecord.get(i).replace(taxonomyRecordID, "") : csvRecord.get(i));
                      }
                      break;

780                 /*
                     * Failsafe error reporting
                     */
                    default:
                      logger.warn("Taxonomy: " + csvRecord.size() + " columns found, should be " + taxonomyNormalNumberOfColumns + ",
  ↪    in CSVRecord: " + csvRecord.toString());
785                   break;
                  }
                }
              }
              genericConcept.flush();
790           taxonomyConcept.flush();
            }
          }
        }

795     /**
         * <p>
         * Writes the value of the last file loaded into the program to the
         * <code>Transform.xml</code> file.
         * </p>
800      *
         * @throws JDOMException When an error occurs in the SAXBuilder class when
         * reading in the ecl@ss HTML file.
         * @throws IOException When a general input/output errors occurs.
         * @since 2.00
805      * @see #loadXML()
         */
        private static void saveXML() throws JDOMException, IOException {
          logger.info("Saving XML Settings");
          XMLOutputter xo = new XMLOutputter();
810       xo.setFormat(Format.getPrettyFormat());
          if (!settings.getRootElement().getChildText("lfl").equals(lastFileLoaded.getPath())) {
            settings.getRootElement().getChild("lfl").setText(lastFileLoaded.getPath());
            xo.output(settings, new FileOutputStream(currentClass.getSimpleName() + ".xml"));
          }
815     }
    }
```

A.2 Log4j 1.2 Configuration

Listing A.2: orlog4j.lcf.

orlog4j.lcf

```
    # Set root logger level to DEBUG and its only appender to TRANSFORM
    log4j.rootLogger=DEBUG, TRANSFORM

    #TRANSFORM is set to be a FileAppender.
5   log4j.appender.TRANSFORM=org.apache.log4j.RollingFileAppender
    log4j.appender.TRANSFORM.File=transform.log
    #log4j.appender.TRANSFORM.MaxFileSize=1000KB
    log4j.appender.TRANSFORM.MaxBackupIndex=1

10  #TRANSFORM uses PatternLayout
    log4j.appender.TRANSFORM.layout=org.apache.log4j.PatternLayout
    log4j.appender.TRANSFORM.layout.ConversionPattern=%d [%t] %-5p (%F:%L) %c - %m%n

    #TRANSFORM level
15  log4j.logger.be.ac.vub.wise.stroobants.pieter.masterthesis=INFO
```

A.3 Log4j 2 Configuration

Listing A.3: log4j2.xml.

log4j2.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<Configuration>
    <Appenders>
        <RollingFile name="Transform" fileName="Transform.log"
                     filePattern="${date:yyyy-MM}/Transform-%d{yyyy-MM-dd}-%i.log.zip">
            <PatternLayout>
                <Pattern>%d [%t] %-5p (%F:%L) %c - %m%n</Pattern>
            </PatternLayout>
            <Policies>
                <TimeBasedTriggeringPolicy/>
                <SizeBasedTriggeringPolicy size="10 MB"/>
            </Policies>
            <DefaultRolloverStrategy max="5" fileIndex="min" compressionLevel="9"/>
        </RollingFile>
    </Appenders>
    <Loggers>
        <Logger name="be.ac.vub.wise.stroobants.pieter.masterthesis" level="info" additivity="false">
            <AppenderRef ref="Transform"/>
        </Logger>
        <Root level="debug">
            <AppenderRef ref="Transform"/>
        </Root>
    </Loggers>
</Configuration>
```

A.4 eClassOWL Documentation Extractor

Listing A.4: extract.pl.

extract.pl

```
# Extractor

#imports
use strict;
use warnings;
use Text::CSV;

#datatype
my $itf = "eclass_514en_datatype_properties.csv";

#objecttype
#my $itf = "eclass_514en_object_properties.csv";

#output file
my $otf = "phasethree$itf";

#line numbers
#datatype
my @lns = (2,3,11,12,21,22,29,30,37,40,48,51,68,69,72,96,72,96,
           133,142,143,153,180,182,183,186,187,188,259,263,276,
       286,287,338,339,352,355,391,441,446,451,452,494,495,
       510,515,531,543,569,574,583,597,660,677,687,719,727,
       808,904,906,907,908,909,973,986,1031,1032,1052,1053,
       1054,1055,1081,1139,1173,1903);

#objecttype
#my @lns = (6,10,11,12,23,24,25,48,101,102,110,112,213,359,414,934,
#           938,941,956,965,1004,1090,1108,1109,1116,1117,1136,1137,
#           1203,1204,1205,1206,1342,1355,1368,1381,1397,1394,1403,
#           1501,1508,1509,1620,1684,1857,2022,2187,2213,2226,2229,
#           2259,2290,2310,2315,2338,2365,2389,2584,2599,2600,2601,
#           2602,2603,2604,2605,2606,2662,2663,2697,2741,2764,2961,
#           2962,2964,2965,2981,2987,3005,3079,3089,3104,3220,3231,
#           3238,3276,3300,3315,3323,3448,3486,3560,3579,3610,3612,
#           3619,3620,3635,3665,3667,3778,3782,3783,3800,3806,3823,
#           3868,3923,3952,3960,3961,3971,3976,3978,4003,4066,4079,
#           4080,4083,4084,4087,4146,4163,4202,4229,4235,4241,4243,
#           4714,4770,4792);
```

```
#open the file
open(ITF,"<:encoding(utf8)","$itf") || die("Could not open file $itf for reading");
open(OTF,">:encoding(utf8)","$otf") || die("Could not open file $otf for writing");
my $csv = Text::CSV->new({  binary => 1 }) || die("Can not use CSV: " . Text::CSV->error_diag ());
my @lines = <ITF>;

#main program
print("Outputting file\n");
$csv->parse($lines[0]);
my @header = $csv->fields();
for (my $i = 0; $i < scalar(@lns); $i++) {
  $csv->parse($lines[$lns[$i] - 1]);
    my @columns = $csv->fields();
    for (my $j = 0; $j < scalar(@columns); $j++) {
        print(OTF $header[$j] . "\t" . $columns[$j]);
        if ($j < scalar(@columns) - 1) {
        print(OTF "\n");
    } elsif ($i < scalar(@lns) - 1) {
        print(OTF "\n\n");
    }
    }
}

#close the file
close(ITF);
close(OTF);
```

A.5 Getschema.org Webservice Consumer

Listing A.5: getschemaorg.pl.

getschemaorg.pl

```
# Getschema.org microdata/rdfalite website extractor.
# Written by Pieter Stroobants on 20 March 2015

# http://getschema.org/microdataextractor
# Parameters:
#   url: The URL of the page containing Microdata annotations.
#        If its value is not a valid URL or the URL does not locate
#        a resource then the service will return an error.
#   out: A parameter specifying the type of desired output.
#        The allowed values are rdf, n3 and json.
#        Any other value is treated as invalid and the service
#        will return an error.
# http://getschema.org/rdfaliteextractor
# Parameters:
#   url: The URL of the page containing RDFaLite annotations.
#        If its value is not a valid URL or the URL does not locate
#        a resource then the service will return an error.
#   out: A parameter specifying the type of desired output.
#        The allowed values are rdf, n3 and json.
#        Any other value is treated as invalid and the service
#        will return an error.

# Imports
use utf8;
use strict;
use warnings;
use URI;
use LWP::UserAgent;

# Constants
my $outputtype = "rdf";

# Parameters for the request
my $serviceurl;
my $service = lc($ARGV[0]);
my $otf = $ARGV[1];
my $url = $ARGV[2];

# if the program is used for on single URL,
# uncomment the following block of code for
# automatic output file name selection.
#if(rindex($url, "/") + 1 == length($url)) {
#  my $lasti = rindex($url, "/");
```

```
#  my $slasti = rindex($url, "/", $lasti - 1);
#  $otf = substr($url, $slasti + 1, $lasti - $slasti - 1);
#} else {
#  $otf = substr($url, rindex($url, "/") + 1);
#}

# Create a user agent
my $ua = LWP::UserAgent->new();

# Generate the URI
if($service eq "microdata") {
  $serviceurl = URI->new("http://getschema.org/microdataextractor");
  $otf .= ".md";
} elsif ($service eq "rdfalite") {
  $serviceurl = URI->new("http://getschema.org/rdfaliteextractor");
  $otf .= ".rdf";
} else {
  die("Error: Invalid argument '$service' value\n" .
      "Use this program like:\n" .
      "perl $0 service url\n" .
      "Where service is either 'microdata' or 'rdfalite'.\n");
}
$serviceurl->query_form(
  "url" => $url,
  "out" => $outputtype);

# Perform the request
my $response = $ua->get($serviceurl);

# Check for HTTP error codes
die("http status: " .
    $response->code .
    " " .
    $response->message)
unless ($response->is_success);

open(OTF, ">>:encoding(utf8)", $otf) ||
die("Could not open file '$otf' for writing");
binmode(OTF);

# Output the entry
print(OTF $response->content . "\n");
close(OTF);
```

A.6 Annotation Extractor Driver Program

Listing A.6: driver.pl.

driver.pl

```
# Driver program to extract website annotations.
# Written by Pieter Stroobants on 29 March 2015

# Imports
use utf8;
use strict;
use warnings;

# My vars
my $trun = lc($ARGV[0]);
my $itf = $ARGV[1];
my $otf = substr($itf, 0, rindex($itf, "."));
my $totalreq = 0;
my $successfulreq = 0;
my $page;

# Open the file
open(ITF, "<:encoding(utf8)", $itf) ||
die("Could not open file '$itf' for reading");

# Main program
print("Processing '$itf' file\n");
while(<ITF>) {
  if($trun eq "extension") {
    $page = substr($_, 0, rindex($_, "."));
  } elsif($trun eq "tillslash") {
```

```
    $page = substr($_, 0, rindex($_, "/"));
  } elsif($trun eq "includeslash") {
    $page = substr($_, 0, rindex($_, "/") + 1);
  } elsif($trun eq "none") {
    $page = $_;
  } else {
    print("Unknown '$trun', defaulting to 'none'");
    $page = $_;
  }
  print("Processing: $page\n");
  chomp($page);
  local @ARGV = ("microdata", $otf, $page);
  do "getschemaorg.pl";
  local @ARGV = ("rdfalite", $otf, $page);
  do "getschemaorg.pl";
  $totalreq++;
  # We only check once for errors.
  if($@ ne "") {
    print("Error: " . $@);
  } else {
    $successfulreq++;
  }
}

# Successful Requests
print("Successful requests: $successfulreq\n");
print("Out of: $totalreq\n");

# Close the file
close(ITF);
```

APPENDIX B

Ontology

Model;
Camera Ontology;
Camera Ontology OOPS! Verification;
SWRL Reasoner

"I love deadlines. I love the whooshing noise they make as they go by." [see Ada03, Prologue, Epilogue]

Douglas Adams (⋆ 1952 – 2001 †)

B.1 Model

Listing B.1: model.orm.

model.orm

```
<?xml version="1.0" encoding="utf-8"?>
<ormRoot:ORM2 xmlns:orm="http://schemas.neumont.edu/ORM/2006-04/ORMCore"
  ↪    xmlns:ormDiagram="http://schemas.neumont.edu/ORM/2006-04/ORMDiagram"
  ↪    xmlns:ormRoot="http://schemas.neumont.edu/ORM/2006-04/ORMRoot">
  <orm:ORMModel id="_638D5BBE-FCD1-404C-BF62-EF3326596DE2" Name="Sony Product Catalogue">
    <orm:Objects>
      <orm:EntityType id="_24C72771-A4C9-4CB6-A541-68C6B7974248" Name="Vendor" _ReferenceMode="name">
        <orm:PlayedRoles>
          <orm:Role ref="_EE0EDBB7-185B-4FAC-B402-094AA27730DB" />
          <orm:Role ref="_852AD7BF-D259-4E8E-AEF5-DF203B0E5A7A" />
          <orm:Role ref="_C6B19B45-313F-4208-BEFF-BB555F7A3376" />
          <orm:Role ref="_CC1D19C7-6ABF-4248-8BD8-A18190F367DD" />
        </orm:PlayedRoles>
        <orm:PreferredIdentifier ref="_E3118295-AE03-42A5-8AEA-7B36CC0CBEB0" />
      </orm:EntityType>
      <orm:ValueType id="_32917A2F-6D06-4AF4-8C64-C27AAF9BBD0E" Name="Vendor_name">
        <orm:PlayedRoles>
          <orm:Role ref="_718AB1B4-1E4C-486D-8FA6-16925EAB2BB2" />
        </orm:PlayedRoles>
        <orm:ConceptualDataType id="_1EE17665-976C-479D-BA99-33B552757FD5" ref="_93D57FD3-B466-4A01-87B5-53103FA8AA05"
  ↪    Scale="0" Length="0" />
      </orm:ValueType>
      <orm:EntityType id="_9DB0DC4D-EEA2-4374-A6A0-FD94072BE3B6" Name="Product" _ReferenceMode="code">
        <orm:PlayedRoles>
          <orm:Role ref="_543A302A-2379-4542-B9F5-DA602690DFE1" />
          <orm:Role ref="_0C914B06-74E4-4888-BCDC-8687CF8A0828" />
          <orm:Role ref="_B2026AE6-8445-4E82-A30D-E67E44D2565D" />
          <orm:Role ref="_6D063B52-A49A-4BB4-A3D2-BAA003C52453" />
          <orm:Role ref="_6608387C-9BB0-4EA8-B0AB-6A7095C6D4B2" />
          <orm:Role ref="_18BEFD94-F95F-47A4-8FFE-92D01421A363" />
          <orm:Role ref="_549C3DA5-E2CC-4702-86E7-B1B0B64AA316" />
          <orm:Role ref="_5B619569-F7ED-4027-98CE-E0C50C964D84" />
          <orm:Role ref="_139FF675-0FF7-4DEC-AE0C-AA36BD772074" />
          <orm:Role ref="_0918D79D-A28D-4D39-9D05-DCE553232415" />
          <orm:Role ref="_02B205AE-B72C-4B4D-BF3E-FE5F0D1F7FB8" />
          <orm:Role ref="_E42BD0D2-3012-4765-B595-377C1046CCC3" />
          <orm:SupertypeMetaRole ref="_EB27E4DC-C75D-475C-A86A-6CFDE6CB7D50" />
          <orm:Role ref="_F21B4EA0-CAA4-429D-B8F7-24ADA1505760" />
          <orm:Role ref="_A0902E30-16E8-41B6-AD7E-5F295DA0A2B8" />
        </orm:PlayedRoles>
        <orm:PreferredIdentifier ref="_918E7ADE-376B-4936-8862-CA7F14F214B9" />
      </orm:EntityType>
      <orm:EntityType id="_2B813E51-CA2A-4A64-8A6E-27DBA6811819" Name="Series" _ReferenceMode="code">
        <orm:PlayedRoles>
          <orm:Role ref="_D6776A4F-B470-44F9-8505-17A38C8552DA" />
          <orm:Role ref="_F378E15D-6292-4DF4-B79D-C55E42003BC4" />
          <orm:Role ref="_AFD7DA10-5E29-4097-BCDD-528FF0C02026" />
          <orm:Role ref="_E57CC207-7A16-4A00-A112-9C71FBD7E567" />
          <orm:Role ref="_3A35B152-C40F-4971-9E8F-ACA1DB5D0BD0" />
          <orm:Role ref="_49C7FBC9-D8DF-4304-8C3A-30A2F80905D7" />
          <orm:Role ref="_C766C207-9BF9-4718-B485-8F87767E63B0" />
        </orm:PlayedRoles>
        <orm:PreferredIdentifier ref="_9B7D4982-DB8C-4F8D-B181-5BC3C9155C29" />
      </orm:EntityType>
      <orm:ValueType id="_EB83DA6F-B8B5-4A98-8822-6A508624A8E7" Name="Series_code">
        <orm:PlayedRoles>
          <orm:Role ref="_D98784F8-860C-46FC-A8A6-A16509C623A1" />
        </orm:PlayedRoles>
        <orm:ConceptualDataType id="_2DEC0CF6-8ED6-43C4-8F4C-347FBA8092A3" ref="_7716D862-0139-40F1-ACD2-D599181FA4AF"
  ↪    Scale="0" Length="0" />
      </orm:ValueType>
      <orm:EntityType id="_972505C0-4E17-4B80-8F08-774B6B4E72C5" Name="ProductSubCategory" _ReferenceMode="code">
        <orm:PlayedRoles>
          <orm:Role ref="_50455695-24F7-489E-B91B-A7198B447CC4" />
          <orm:Role ref="_21A182F1-70A6-4987-A3B2-4256FC31E1D8" />
          <orm:Role ref="_42E596B2-68A4-417D-BBA5-7633110084E0" />
          <orm:Role ref="_12DA7F88-5836-4F88-983D-E1A014D8F6AF" />
          <orm:Role ref="_08E7FE92-57E5-4AE8-8CE7-EA2ACF9D3636" />
          <orm:Role ref="_DD34A933-F875-4FBD-8FAA-8A10F1F06144" />
          <orm:Role ref="_0EB04D36-02A8-4C46-AFC6-9C05634CAB67" />
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B.2 Camera Ontology

Listing B.2: cameraontology.owl.

cameraontology.owl

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<!DOCTYPE rdf:RDF [
    <!ENTITY og "http://ogp.me/ns#" >
    <!ENTITY s "http://schema.org/" >
    <!ENTITY fb "http://ogp.me/ns/fb#" >
    <!ENTITY product "http://ogp.me/ns/product#" >
    <!ENTITY dcterms "http://purl.org/dc/terms/" >
    <!ENTITY website "http://ogp.me/ns/website#" >
    <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
    <!ENTITY dctype "http://purl.org/dc/dcmitype/" >
    <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
    <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
    <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
    <!ENTITY dc "http://purl.org/dc/elements/1.1/" >
    <!ENTITY gr "http://purl.org/goodrelations/v1#" >
    <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
    <!ENTITY skos "http://www.w3.org/2004/02/skos/core#" >
    <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
    <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
    <!ENTITY eco "http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#" >
    <!ENTITY cameraontology "http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#" >
]>


<rdf:RDF xmlns="http://www.semanticweb.org/pst/ontologies/2014/10/camera-ontology#"
     xml:base="http://www.semanticweb.org/pst/ontologies/2014/10/camera-ontology"
     xmlns:product="http://ogp.me/ns/product#"
     xmlns:website="http://ogp.me/ns/website#"
     xmlns:owl="http://www.w3.org/2002/07/owl#"
     xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
     xmlns:swrl="http://www.w3.org/2003/11/swrl#"
     xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
     xmlns:skos="http://www.w3.org/2004/02/skos/core#"
     xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
     xmlns:gr="http://purl.org/goodrelations/v1#"
     xmlns:cameraontology="http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#"
     xmlns:eco="http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#"
     xmlns:s="http://schema.org/"
     xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
     xmlns:dctype="http://purl.org/dc/dcmitype/"
     xmlns:og="http://ogp.me/ns#"
     xmlns:dcterms="http://purl.org/dc/terms/"
     xmlns:fb="http://ogp.me/ns/fb#"
     xmlns:foaf="http://xmlns.com/foaf/0.1/"
     xmlns:dc="http://purl.org/dc/elements/1.1/">
    <owl:Ontology rdf:about="http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology">
        <rdfs:label xml:lang="en">Digital Camera Ontology</rdfs:label>
        <owl:versionInfo rdf:datatype="&xsd;decimal">1.0</owl:versionInfo>
        <rdfs:comment xml:lang="en">Digital Camera Ontology

For more information see:
http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:comment>
        <skos:note xml:lang="en">Functional: forall x, exists max 1 unique y.
Inverse Functional: forall y, exists max 1 unique x.
Transitive: a,b and b,c =&gt; a,c.
Symmetric: a,b =&gt; b,a
Asymmetric: a,b =&gt; no b,a
Reflexive: a,a
IReflexive: no a,a

Property chain: nearby country isLocatedIn o borders (o is syntax)
Equivalent classes: and = intersect, or = union</skos:note>
        <rdfs:seeAlso rdf:resource="&cameraontology;CameraOntology"/>
        <dc:publisher rdf:resource="&cameraontology;Pieter_Stroobants"/>
    </owl:Ontology>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Annotation properties
```

```
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->



    <!-- http://purl.org/dc/elements/1.1/publisher -->

    <owl:AnnotationProperty rdf:about="&dc;publisher">
        <rdfs:label xml:lang="en">publisher</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:comment xml:lang="en">An entity responsible for making the resource available.

Examples of a Publisher include a person, an organization, or a service. Typically, the name of a Publisher should be used to
  ↪    indicate the entity.</rdfs:comment>
        <rdfs:range rdf:resource="&dcterms;Agent"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:AnnotationProperty>



    <!-- http://purl.org/dc/terms/publisher -->

    <owl:AnnotationProperty rdf:about="&dcterms;publisher">
        <rdfs:label xml:lang="en">publisher</rdfs:label>
        <rdfs:comment xml:lang="en">An entity responsible for making the resource available.

Examples of a Publisher include a person, an organization, or a service.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;publisher"/>
        <rdfs:range rdf:resource="&dcterms;Agent"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:AnnotationProperty>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#hierarchyCode -->

    <owl:AnnotationProperty rdf:about="&eco;hierarchyCode">
        <rdfs:label xml:lang="en">hierarchy code</rdfs:label>
        <rdfs:comment xml:lang="en">eClass hieracy Code</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&eco;C_AKJ313002-tax"/>
        <rdfs:range rdf:resource="&xsd;int"/>
    </owl:AnnotationProperty>



    <!-- http://www.w3.org/2000/01/rdf-schema#comment -->

    <rdf:Description rdf:about="&rdfs;comment">
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </rdf:Description>



    <!-- http://www.w3.org/2000/01/rdf-schema#isDefinedBy -->

    <rdf:Description rdf:about="&rdfs;isDefinedBy">
        <rdfs:label xml:lang="en">is defined by</rdfs:label>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </rdf:Description>



    <!-- http://www.w3.org/2000/01/rdf-schema#label -->

    <rdf:Description rdf:about="&rdfs;label">
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </rdf:Description>


```

```
    <!-- http://www.w3.org/2000/01/rdf-schema#seeAlso -->

    <rdf:Description rdf:about="&rdfs;seeAlso">
        <rdfs:label xml:lang="en">see also</rdfs:label>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Document"/>
    </rdf:Description>



    <!-- http://www.w3.org/2002/07/owl#deprecated -->

    <rdf:Description rdf:about="&owl;deprecated">
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </rdf:Description>



    <!-- http://www.w3.org/2002/07/owl#versionInfo -->

    <rdf:Description rdf:about="&owl;versionInfo">
        <rdfs:label xml:lang="en">version info</rdfs:label>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </rdf:Description>



    <!-- http://www.w3.org/2004/02/skos/core#note -->

    <owl:AnnotationProperty rdf:about="&skos;note">
        <rdfs:label xml:lang="en">note</rdfs:label>
        <rdfs:comment xml:lang="en">A general note, for any purpose.

This property may be used directly, or as a super-property for more specific note types.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.w3.org/2004/02/skos/core</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:AnnotationProperty>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Object Properties
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->



    <!-- http://ogp.me/ns#image -->

    <owl:ObjectProperty rdf:about="&og;image">
        <rdfs:label xml:lang="en">image (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Thing can have an Image.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&s;image"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOgImageOf"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Image"/>
        <owl:equivalentProperty rdf:resource="&foaf;depiction"/>
    </owl:ObjectProperty>



    <!-- http://ogp.me/ns#video -->

    <owl:ObjectProperty rdf:about="&og;video">
        <rdfs:label xml:lang="en">video (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Creative Work or Product can have a Video Object.</rdfs:comment>
        <rdfs:range rdf:resource="&s;VideoObject"/>
        <owl:equivalentProperty rdf:resource="&s;video"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOgVideoOf"/>
```

```
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://ogp.me/ns#image:height -->

    <owl:ObjectProperty rdf:about="&og;image:height">
        <rdfs:label xml:lang="en">image height (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The height of an image.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&og;Image"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOgImageHeightOf"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;mediaHeight"/>
    </owl:ObjectProperty>


    <!-- http://ogp.me/ns#image:width -->

    <owl:ObjectProperty rdf:about="&og;image:width">
        <rdfs:label xml:lang="en">image width (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The width of an image.</rdfs:comment>
        <rdfs:domain rdf:resource="&og;Image"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;mediaWidth"/>
    </owl:ObjectProperty>



    <!-- http://ogp.me/ns#video:height -->

    <owl:ObjectProperty rdf:about="&og;video:height">
        <rdfs:label xml:lang="en">video height (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The height of a video.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&og;Video"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;mediaHeight"/>
    </owl:ObjectProperty>


    <!-- http://ogp.me/ns#video:width -->

    <owl:ObjectProperty rdf:about="&og;video:width">
        <rdfs:label xml:lang="en">video width (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The width of a video.</rdfs:comment>
        <rdfs:domain rdf:resource="&og;Video"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOgVideoWidthOf"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;mediaWidth"/>
    </owl:ObjectProperty>


    <!-- http://ogp.me/ns/product#brand -->

    <owl:ObjectProperty rdf:about="&product;brand">
        <rdfs:label xml:lang="en">brand (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The brand of the product or its original manufacturer.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;Brand"/>
        <owl:equivalentProperty rdf:resource="&gr;hasBrand"/>
        <owl:equivalentProperty rdf:resource="&s;brand"/>
        <owl:inverseOf rdf:resource="&cameraontology;productBrands"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
```

```
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://ogp.me/ns/product#weight -->

    <owl:ObjectProperty rdf:about="&product;weight">
        <rdfs:label xml:lang="en">weight (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The weight of the product.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <owl:equivalentProperty rdf:resource="&gr;weight"/>
        <owl:equivalentProperty rdf:resource="&s;weight"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/elements/1.1/contributor -->

    <owl:ObjectProperty rdf:about="&dc;contributor">
        <rdfs:label xml:lang="en">contributor (0..*)</rdfs:label>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪   namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪   (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An entity responsible for making contributions to the resource.

Examples of a Contributor include a person, an organization, or a service. Typically, the name of a Contributor should be used
  ↪   to indicate the entity.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&dcterms;contributor"/>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&s;contributor"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/elements/1.1/creator -->

    <owl:ObjectProperty rdf:about="&dc;creator">
        <rdfs:label xml:lang="en">creator (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪   namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪   (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:comment xml:lang="en">An entity primarily responsible for making the resource.

Examples of a Creator include a person, an organization, or a service. Typically, the name of a Creator should be used to
  ↪   indicate the entity.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&dcterms;creator"/>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&s;creator"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;maker"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/elements/1.1/format -->

    <owl:ObjectProperty rdf:about="&dc;format">
        <rdfs:label xml:lang="en">format (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪   namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪   (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:comment xml:lang="en">The file format, physical medium, or dimensions of the resource.

Examples of dimensions include size and duration. Recommended best practice is to use a controlled vocabulary such as the list
  ↪   of Internet Media Types [MIME].</rdfs:comment>
        <rdfs:range rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <owl:equivalentProperty rdf:resource="&dcterms;format"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
```

```
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/elements/1.1/language -->

    <owl:ObjectProperty rdf:about="&dc;language">
        <rdfs:label xml:lang="en">language (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A language of the resource.

Recommended best practice is to use a controlled vocabulary such as RFC 4646 [RFC4646].</rdfs:comment>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:seeAlso>http://www.ietf.org/rfc/rfc4646.txt</rdfs:seeAlso>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&dcterms;language"/>
        <rdfs:range rdf:resource="&s;Language"/>
        <rdfs:domain rdf:resource="&s;WriteAction"/>
        <owl:equivalentProperty rdf:resource="&s;language"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/elements/1.1/relation -->

    <owl:ObjectProperty rdf:about="&dc;relation">
        <rdfs:label xml:lang="en">relation (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A related resource.

Recommended best practice is to identify the related resource by means of a string conforming to a formal identification
  ↪    system.</rdfs:comment>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&dcterms;relation"/>
        <owl:inverseOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/terms/contributor -->

    <owl:ObjectProperty rdf:about="&dcterms;contributor">
        <rdfs:label xml:lang="en">contributor (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An entity responsible for making contributions to the resource.

Examples of a Contributor include a person, an organization, or a service.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;contributor"/>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&s;contributor"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/terms/creator -->

    <owl:ObjectProperty rdf:about="&dcterms;creator">
        <rdfs:label xml:lang="en">creator (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An entity primarily responsible for making the resource.

Examples of a Creator include a person, an organization, or a service.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;creator"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;contributor"/>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&s;creator"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;maker"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/dc/terms/extent -->
```

```
    <owl:ObjectProperty rdf:about="&dcterms;extent">
        <rdfs:label xml:lang="en">extent (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The size or duration of the resource.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;format"/>
        <rdfs:range rdf:resource="&dcterms;SizeOrDuration"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;format"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/format -->

    <owl:ObjectProperty rdf:about="&dcterms;format">
        <rdfs:label xml:lang="en">format (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The file format, physical medium, or dimensions of the resource.

Examples of dimensions include size and duration. Recommended best practice is to use a controlled vocabulary such as the list
  ↪   of Internet Media Types [MIME].</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;format"/>
        <rdfs:range rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/hasFormat -->

    <owl:ObjectProperty rdf:about="&dcterms;hasFormat">
        <rdfs:label xml:lang="en">has format (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A related resource that is substantially the same as the pre-existing described resource,
  ↪   but in another format.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <owl:inverseOf rdf:resource="&dcterms;isFormatOf"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/hasPart -->

    <owl:ObjectProperty rdf:about="&dcterms;hasPart">
        <rdfs:label xml:lang="en">has part (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A related resource that is included either physically or logically in the described
  ↪   resource.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <owl:inverseOf rdf:resource="&dcterms;isPartOf"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/hasVersion -->

    <owl:ObjectProperty rdf:about="&dcterms;hasVersion">
        <rdfs:label xml:lang="en">has version (0..*)</rdfs:label>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">A related resource that is a version, edition, or adaptation of the described
    ↪   resource.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <owl:inverseOf rdf:resource="&dcterms;isVersionOf"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/isFormatOf -->

    <owl:ObjectProperty rdf:about="&dcterms;isFormatOf">
        <rdfs:label xml:lang="en">is format of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A related resource that is substantially the same as the described resource, but in another
    ↪   format.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
    ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
    ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/isPartOf -->

    <owl:ObjectProperty rdf:about="&dcterms;isPartOf">
        <rdfs:label xml:lang="en">is part of (0..*)</rdfs:label>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
    ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
    ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A related resource in which the described resource is physically or logically
    ↪   included.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/isReplacedBy -->

    <owl:ObjectProperty rdf:about="&dcterms;isReplacedBy">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is replaced by (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A related resource that supplants, displaces, or supersedes the described
    ↪   resource.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
    ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
    ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <owl:equivalentProperty rdf:resource="&s;supersededBy"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/isVersionOf -->

    <owl:ObjectProperty rdf:about="&dcterms;isVersionOf">
```

```
        <rdfs:label xml:lang="en">is version of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A related resource of which the described resource is a version, edition, or adaptation.
595
Changes in version imply substantive changes in content rather than differences in format.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪    (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪    this intention with a formal range declaration.</skos:note>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
600     <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>
605



    <!-- http://purl.org/dc/terms/language -->

610 <owl:ObjectProperty rdf:about="&dcterms;language">
        <rdfs:label xml:lang="en">language (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A language of the resource.

615 Recommended best practice is to use a controlled vocabulary such as RFC 4646 [RFC4646].</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;language"/>
        <rdfs:range rdf:resource="&s;Language"/>
        <rdfs:domain rdf:resource="&s;WriteAction"/>
        <owl:equivalentProperty rdf:resource="&s;language"/>
620 </owl:ObjectProperty>



    <!-- http://purl.org/dc/terms/relation -->
625

    <owl:ObjectProperty rdf:about="&dcterms;relation">
        <rdfs:label xml:lang="en">relation (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A related resource.

630 Recommended best practice is to identify the related resource by means of a string conforming to a formal identification
  ↪    system.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪    (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪    this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
635     <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



640 <!-- http://purl.org/dc/terms/replaces -->

    <owl:ObjectProperty rdf:about="&dcterms;replaces">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
645     <rdfs:label xml:lang="en">replaces (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A related resource that is supplanted, displaced, or superseded by the described
  ↪    resource.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪    (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪    this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;relation"/>
650     <owl:inverseOf rdf:resource="&dcterms;isReplacedBy"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;relation"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;SSupersedes"/>
655     <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDctRelation"/>
    </owl:ObjectProperty>


660

    <!-- http://purl.org/goodrelations/v1#depth -->
```

```
    <owl:ObjectProperty rdf:about="&gr;depth">
        <rdfs:label xml:lang="en">depth (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The depth of the product.
Typical unit code(s): CMT for centimeters, INH for inches</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <owl:equivalentProperty rdf:resource="&s;depth"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrDepthOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#equal -->

    <owl:ObjectProperty rdf:about="&gr;equal">
        <rdf:type rdf:resource="&owl;SymmetricProperty"/>
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">equal (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is equal to the
    object.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <owl:equivalentProperty rdf:resource="&s;equal"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#greater -->

    <owl:ObjectProperty rdf:about="&gr;greater">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">greater (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is greater than the
    object.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <owl:equivalentProperty rdf:resource="&s;greater"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#greaterOrEqual -->

    <owl:ObjectProperty rdf:about="&gr;greaterOrEqual">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">greater or equal (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is greater than or
    equal to the object.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <owl:inverseOf rdf:resource="&gr;lesserOrEqual"/>
        <owl:equivalentProperty rdf:resource="&s;greaterOrEqual"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#hasBrand -->

    <owl:ObjectProperty rdf:about="&gr;hasBrand">
        <rdfs:label xml:lang="en">has brand (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This specifies the brand or brands (gr:Brand) associated with a gr:ProductOrService, or the
    brand or brands maintained by a gr:BusinessEntity.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;Brand"/>
        <owl:equivalentProperty rdf:resource="&s;brand"/>
        <owl:inverseOf rdf:resource="&cameraontology;grBrands"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
```

```
    </owl:ObjectProperty>


    <!-- http://purl.org/goodrelations/v1#hasEligibleQuantity -->

    <owl:ObjectProperty rdf:about="&gr;hasEligibleQuantity">
        <rdfs:label xml:lang="en">has eligible quantity (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This specifies the interval and unit of measurement of ordering quantities for which the
  ↪   gr:Offering or gr:PriceSpecification is valid. This allows e.g. specifying that a certain freight charge is valid only
  ↪   for a certain quantity.
Note that if an offering is a bundle, i.e. it consists of more than one unit of a single type of good, or if the unit of
  ↪   measurement for the good is different from unit (Common Code C62), then gr:hasEligibleQuantity refers to units of this
  ↪   bundle. In other words, &quot;C62&quot; for &quot;Units or pieces&quot; is usually the appropriate unit of
  ↪   measurement.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <owl:equivalentProperty rdf:resource="&s;eligibleQuantity"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;PriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://purl.org/goodrelations/v1#hasMakeAndModel -->

    <owl:ObjectProperty rdf:about="&gr;hasMakeAndModel">
        <rdfs:label xml:lang="en">has make and model (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This states that an actual product instance (gr:Individual) or a placeholder instance for
  ↪   multiple, unidentified such instances (gr:SomeItems) is one occurence of a particular gr:ProductOrServiceModel.

Example: myFordT hasMakeAndModel FordT.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:equivalentProperty rdf:resource="&s;model"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://purl.org/goodrelations/v1#hasManufacturer -->

    <owl:ObjectProperty rdf:about="&gr;hasManufacturer">
        <rdfs:label xml:lang="en">has manufacturer (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This object property links a gr:ProductOrService to the gr:BusinessEntity that produces it.
  ↪   Mostly used with gr:ProductOrServiceModel.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;BusinessEntity"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&s;manufacturer"/>
        <owl:inverseOf rdf:resource="&cameraontology;grManufactures"/>
    </owl:ObjectProperty>


    <!-- http://purl.org/goodrelations/v1#hasPriceSpecification -->

    <owl:ObjectProperty rdf:about="&gr;hasPriceSpecification">
        <rdfs:label xml:lang="en">has price specification (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This links a gr:Offering to a gr:PriceSpecification or specifications. There can be unit
  ↪   price specifications, payment charge specifications, and delivery charge specifications. For each type, multiple
  ↪   specifications for the same gr:Offering are possible, e.g. for different quantity ranges or for different currencies, or
  ↪   for different combinations of gr:DeliveryMethod and target destinations.

Recommended retail prices etc. can be marked by the gr:priceType property of the gr:UnitPriceSpecification.</rdfs:comment>
```

```
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <rdfs:range rdf:resource="&gr;PriceSpecification"/>
        <owl:equivalentProperty rdf:resource="&s;priceSpecification"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrPriceSpecificationOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#height -->

    <owl:ObjectProperty rdf:about="&gr;height">
        <rdfs:label xml:lang="en">height (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The height of the product.
Typical unit code(s): CMT for centimeters, INH for inches</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <owl:equivalentProperty rdf:resource="&s;height"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrHeightOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#includes -->

    <owl:ObjectProperty rdf:about="&gr;includes">
        <rdfs:label xml:lang="en">includes (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This object property is a shortcut for the original gr:includesObject property for the
  ↪    common case of having exactly one single gr:ProductOrService instance included in an Offering.

When linking to an instance of gr:SomeItems or gr:Individual, it is equivalent to using a gr:TypeAndQuantityNode with
  ↪    gr:hasUnitOfMeasurement=&quot;C62&quot;^^xsd:string and gr:amountOfThisGood=&quot;1.0&quot;^^xsd:float for that good.

When linking to a gr:ProductOrServiceModel, it is equivalent to
1. defining an blank node for a gr:SomeItems
2. linking that blank node via gr:hasMakeAndModel to the gr:ProductOrServiceModel, and
3. linking from the gr:Offering to that blank node using another blank node of type gr:TypeAndQuantityNode with
  ↪    gr:hasUnitOfMeasurement=&quot;C62&quot;^^xsd:string and gr:amountOfThisGood=&quot;1.0&quot;^^xsd:float for that
  ↪    good.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&s;itemOffered"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrIncludedIn"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#includesObject -->

    <owl:ObjectProperty rdf:about="&gr;includesObject">
        <rdfs:label xml:lang="en">includes object (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This object property links a gr:Offering to one or multiple gr:TypeAndQuantityNode or nodes
  ↪    that specify the components that are included in the respective offer.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <rdfs:range rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:equivalentProperty rdf:resource="&s;includesObject"/>
        <owl:inverseOf rdf:resource="&cameraontology;objectIsGrIncludedIn"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#isAccessoryOrSparePartFor -->

    <owl:ObjectProperty rdf:about="&gr;isAccessoryOrSparePartFor">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is accessory or spare part for (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This states that a particular gr:ProductOrService is an accessory or spare part for another
  ↪    product or service.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&s;isAccessoryOrSparePartFor"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasGrAccessoryOrSparePart"/>
    </owl:ObjectProperty>
```

```
880
    <!-- http://purl.org/goodrelations/v1#isConsumableFor -->

    <owl:ObjectProperty rdf:about="&gr;isConsumableFor">
885         <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is consumable for (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This states that a particular gr:ProductOrService is a consumable for another product or
  ↪    service.</rdfs:comment>
890     <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&s;isConsumableFor"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasGrConsumable"/>
    </owl:ObjectProperty>
895


    <!-- http://purl.org/goodrelations/v1#isSimilarTo -->

900 <owl:ObjectProperty rdf:about="&gr;isSimilarTo">
        <rdf:type rdf:resource="&owl;SymmetricProperty"/>
        <rdfs:label xml:lang="en">is similar to (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This states that a given gr:ProductOrService is similar to another product or service. Of
  ↪    course, this is a subjective statement; when interpreting it, the trust in the origin of the statement should be taken
  ↪    into account.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
905     <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&s;isSimilarTo"/>
    </owl:ObjectProperty>

910


    <!-- http://purl.org/goodrelations/v1#isVariantOf -->

    <owl:ObjectProperty rdf:about="&gr;isVariantOf">
915     <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is variant of (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
920     <rdfs:comment xml:lang="en">This states that a particular gr:ProductOrServiceModel is a variant of another product or
  ↪    service model. It is pretty safe to infer that the variant inherits all gr:quantitativeProductOrServiceProperty,
  ↪    gr:qualitativeProductOrServiceProperty, and gr:datatypeProductOrServiceProperty values that are defined for the first
  ↪    gr:ProductOrServiceModel.

    Example:
    foo:Red_Ford_T_Model gr:isVariantOf foo:Ford_T_Model</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
925     <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:equivalentProperty rdf:resource="&s;isVariantOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasGrVariant"/>
    </owl:ObjectProperty>

930


    <!-- http://purl.org/goodrelations/v1#lesser -->

    <owl:ObjectProperty rdf:about="&gr;lesser">
935     <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">lesser (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for gr:QualitativeValue pairs indicates that the subject is lesser
  ↪    than the object.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
940     <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <owl:inverseOf rdf:resource="&gr;greater"/>
        <owl:equivalentProperty rdf:resource="&s;lesser"/>
    </owl:ObjectProperty>

945


    <!-- http://purl.org/goodrelations/v1#lesserOrEqual -->

    <owl:ObjectProperty rdf:about="&gr;lesserOrEqual">
950     <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">lesser or equal (0..*)</rdfs:label>
```

```
        <rdfs:comment xml:lang="en">This ordering relation for gr:QualitativeValue pairs indicates that the subject is lesser
    ↪   than or equal to the object.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <owl:equivalentProperty rdf:resource="&s;lesserOrEqual"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#nonEqual -->

    <owl:ObjectProperty rdf:about="&gr;nonEqual">
        <rdf:type rdf:resource="&owl;SymmetricProperty"/>
        <rdfs:label xml:lang="en">non equal (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This ordering relation for gr:QualitativeValue pairs indicates that the subject is not equal
    ↪   to the object.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <owl:equivalentProperty rdf:resource="&s;nonEqual"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#offers -->

    <owl:ObjectProperty rdf:about="&gr;offers">
        <rdfs:label xml:lang="en">offers (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This links a gr:BusinessEntity to the offers (gr:Offering) it makes. If you want to express
    ↪   interest in receiving offers, use gr:seeks instead.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;Offering"/>
        <owl:equivalentProperty rdf:resource="&s;makesOffer"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrOfferedBy"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#owns -->

    <owl:ObjectProperty rdf:about="&gr;owns">
        <rdfs:label xml:lang="en">owns (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property indicates that a particular person or business owns a particular product. It
    ↪   can be used to expose the products in one&amp;apos;s posession in order to empower recommender systems to suggest matching
    ↪   offers.

Note that the product must be an instance of the class gr:Individual.

This property can also be safely applied to foaf:Agent instances.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;Individual"/>
        <owl:equivalentProperty rdf:resource="&s;owns"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrOwnedBy"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#predecessorOf -->

    <owl:ObjectProperty rdf:about="&gr;predecessorOf">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">predecessor of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This property indicates that the subject is a previous, often discontinued variant of the
    ↪   gr:ProductOrServiceModel used as the object.

Example: Golf III predecessorOf Golf IV

This relation is transitive.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:inverseOf rdf:resource="&gr;successorOf"/>
        <owl:equivalentProperty rdf:resource="&s;predecessorOf"/>
    </owl:ObjectProperty>
```

```
    <!-- http://purl.org/goodrelations/v1#qualitativeProductOrServiceProperty -->

    <owl:ObjectProperty rdf:about="&gr;qualitativeProductOrServiceProperty">
        <rdfs:label xml:lang="en">qualitative product or service property (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This is the super property of all qualitative properties for products and services. All
 ↪   properties in product or service ontologies for which gr:QualitativeValue instances are specified are subproperties of
 ↪   this property.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#quantitativeProductOrServiceProperty -->

    <owl:ObjectProperty rdf:about="&gr;quantitativeProductOrServiceProperty">
        <rdfs:label xml:lang="en">quantitative product or service property (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This is the super property of all quantitative  properties for products and services. All
 ↪   properties in product or service ontologies that specify quantitative characteristics, for which an interval is at least
 ↪   theoretically an appropriate value, are subproperties of this property.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#successorOf -->

    <owl:ObjectProperty rdf:about="&gr;successorOf">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">successor of (0..*)</rdfs:label>
       <rdfs:comment xml:lang="en">This property indicates that the subject is a newer, often updated or improved variant of the
 ↪   gr:ProductOrServiceModel used as the object.

Example: Golf III successorOf Golf II

This relation is transitive.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:equivalentProperty rdf:resource="&s;successorOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#typeOfGood -->

    <owl:ObjectProperty rdf:about="&gr;typeOfGood">
        <rdfs:label xml:lang="en">type of good (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This specifies the gr:ProductOrService that the gr:TypeAndQuantityNode is referring
 ↪   to.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:equivalentProperty rdf:resource="&s;typeOfGood"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasGrTypeAndQuantityNode"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#valueReference -->

    <owl:ObjectProperty rdf:about="&gr;valueReference">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">value reference (0..*)</rdfs:label>
```

```
        <rdfs:comment xml:lang="en">The superclass of properties that link a gr:QuantitativeValue or a gr:QualitativeValue to a
    ↪   second gr:QuantitativeValue or a gr:QualitativeValue that provides additional information on the original value. A good
    ↪   modeling practice is to define specializations of this property (e.g. foo:referenceTemperature) for your particular
    ↪   domain.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&s;valueReference"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrValueReferenceOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#weight -->

    <owl:ObjectProperty rdf:about="&gr;weight">
        <rdfs:label xml:lang="en">weight (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The weight of the gr:ProductOrService.
Typical unit code(s): GRM for gram, KGM for kilogram, LBR for pound</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <owl:equivalentProperty rdf:resource="&s;weight"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrWeightOf"/>
    </owl:ObjectProperty>



    <!-- http://purl.org/goodrelations/v1#width -->

    <owl:ObjectProperty rdf:about="&gr;width">
        <rdfs:label xml:lang="en">width (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The width of the gr:ProductOrService.
Typical unit code(s): CMT for centimeters, INH for inches</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <owl:equivalentProperty rdf:resource="&s;width"/>
        <owl:inverseOf rdf:resource="&cameraontology;isGrWidthOf"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/aggregateRating -->

    <owl:ObjectProperty rdf:about="&s;aggregateRating">
        <rdfs:label xml:lang="en">aggregate rating (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/aggregateRating</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The overall rating, based on a collection of reviews or ratings, of the item.</rdfs:comment>
        <rdfs:range rdf:resource="&s;AggregateRating"/>
        <owl:inverseOf rdf:resource="&cameraontology;isSAggregateRatingOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>
```

```
    <!-- http://schema.org/brand -->

    <owl:ObjectProperty rdf:about="&s;brand">
        <rdfs:label xml:lang="en">brand (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/brand</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The brand(s) associated with a product or service, or the brand(s) maintained by an
↪   organization or business person.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;Brand"/>
        <owl:inverseOf rdf:resource="&cameraontology;sBrands"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://schema.org/contributor -->

    <owl:ObjectProperty rdf:about="&s;contributor">
        <rdfs:label xml:lang="en">contributor (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/contributor</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A secondary contributor to the CreativeWork.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasSContributed"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/creator -->

    <owl:ObjectProperty rdf:about="&s;creator">
        <rdfs:label xml:lang="en">creator (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/creator</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The creator/author of this CreativeWork or UserComments. This is the same as the Author
↪   property for CreativeWork.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;maker"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/depth -->

    <owl:ObjectProperty rdf:about="&s;depth">
        <rdfs:label xml:lang="en">depth (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The depth of the product.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/depth</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/eligibleQuantity -->

    <owl:ObjectProperty rdf:about="&s;eligibleQuantity">
        <rdfs:label xml:lang="en">eligible quantity (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/eligibleQuantity</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interval and unit of measurement of ordering quantities for which the offer or price
↪   specification is valid. This allows e.g. specifying that a certain freight charge is valid only for a certain
↪   quantity.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;PriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
```

```
    </owl:ObjectProperty>


    <!-- http://schema.org/equal -->

    <owl:ObjectProperty rdf:about="&s;equal">
        <rdf:type rdf:resource="&owl;SymmetricProperty"/>
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">equal (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/equal</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is equal to the
↪   object.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/greater -->

    <owl:ObjectProperty rdf:about="&s;greater">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">greater (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/greater</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is greater than the
↪   object.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <owl:inverseOf rdf:resource="&s;lesser"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/greaterOrEqual -->

    <owl:ObjectProperty rdf:about="&s;greaterOrEqual">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">greater or equal (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/greaterOrEqual</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is greater than or
↪   equal to the object.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <owl:inverseOf rdf:resource="&s;lesserOrEqual"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/height -->

    <owl:ObjectProperty rdf:about="&s;height">
        <rdfs:label xml:lang="en">height (0..1)</rdfs:label>
        <rdfs:seeAlso xml:lang="en">The definition of mediaHeight in this ontology.</rdfs:seeAlso>
        <rdfs:comment xml:lang="en">The height of the item.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/height</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/image -->

    <owl:ObjectProperty rdf:about="&s;image">
        <rdfs:label xml:lang="en">image (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/image</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An image of the item. This can be a &lt;a
↪   href=&quot;http://schema.org/URL&quot;&gt;URL&lt;/a&gt; or a fully described &lt;a
↪   href=&quot;http://schema.org/ImageObject&quot;&gt;ImageObject&lt;/a&gt;.</rdfs:comment>
        <owl:inverseOf rdf:resource="&cameraontology;isSImageOf"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Image"/>
        <owl:equivalentProperty rdf:resource="&foaf;depiction"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/includesObject -->
```

```
  <owl:ObjectProperty rdf:about="&s;includesObject">
      <rdfs:label xml:lang="en">includes object (0..*)</rdfs:label>
      <rdfs:isDefinedBy>http://schema.org/includesObject</rdfs:isDefinedBy>
      <rdfs:comment xml:lang="en">This links to a node or nodes indicating the exact quantity of the products included in the
↪   offer.</rdfs:comment>
      <rdfs:domain rdf:resource="&gr;Offering"/>
      <rdfs:range rdf:resource="&gr;TypeAndQuantityNode"/>
  </owl:ObjectProperty>


  <!-- http://schema.org/instrument -->

  <owl:ObjectProperty rdf:about="&s;instrument">
      <rdfs:label xml:lang="en">instrument (0..*)</rdfs:label>
      <rdfs:comment xml:lang="en">The object that helped the agent perform the action. e.g. John wrote a book with *a
↪   pen*.</rdfs:comment>
      <rdfs:isDefinedBy>http://schema.org/instrument</rdfs:isDefinedBy>
      <rdfs:domain rdf:resource="&s;Action"/>
      <owl:inverseOf rdf:resource="&cameraontology;isSInstrumentOf"/>
      <rdfs:range rdf:resource="&owl;Thing"/>
  </owl:ObjectProperty>


  <!-- http://schema.org/isAccessoryOrSparePartFor -->

  <owl:ObjectProperty rdf:about="&s;isAccessoryOrSparePartFor">
      <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
      <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
      <rdfs:label xml:lang="en">is accessory or spare part for (0..*)</rdfs:label>
      <rdfs:isDefinedBy>http://schema.org/isAccessoryOrSparePartFor</rdfs:isDefinedBy>
      <rdfs:comment xml:lang="en">A pointer to another product (or multiple products) for which this product is an accessory or
↪   spare part.</rdfs:comment>
      <rdfs:range rdf:resource="&gr;ProductOrService"/>
      <rdfs:domain rdf:resource="&gr;ProductOrService"/>
      <owl:inverseOf rdf:resource="&cameraontology;hasSAccessoryOrSparePart"/>
  </owl:ObjectProperty>


  <!-- http://schema.org/isConsumableFor -->

  <owl:ObjectProperty rdf:about="&s;isConsumableFor">
      <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
      <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
      <rdfs:label xml:lang="en">is consumable for (0..*)</rdfs:label>
      <rdfs:comment xml:lang="en">A pointer to another product (or multiple products) for which this product is a
↪   consumable.</rdfs:comment>
      <rdfs:isDefinedBy>http://schema.org/isConsumableFor</rdfs:isDefinedBy>
      <rdfs:range rdf:resource="&gr;ProductOrService"/>
      <rdfs:domain rdf:resource="&gr;ProductOrService"/>
      <owl:inverseOf rdf:resource="&cameraontology;hasSConsumable"/>
  </owl:ObjectProperty>


  <!-- http://schema.org/isSimilarTo -->

  <owl:ObjectProperty rdf:about="&s;isSimilarTo">
      <rdf:type rdf:resource="&owl;SymmetricProperty"/>
      <rdfs:label xml:lang="en">is similar to (0..*)</rdfs:label>
      <rdfs:comment xml:lang="en">A pointer to another, functionally similar product (or multiple products).</rdfs:comment>
      <rdfs:isDefinedBy>http://schema.org/isSimilarTo</rdfs:isDefinedBy>
      <rdfs:domain rdf:resource="&gr;ProductOrService"/>
      <rdfs:range rdf:resource="&gr;ProductOrService"/>
  </owl:ObjectProperty>


  <!-- http://schema.org/isVariantOf -->

  <owl:ObjectProperty rdf:about="&s;isVariantOf">
      <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
      <rdfs:label xml:lang="en">is variant of (0..1)</rdfs:label>
      <rdfs:isDefinedBy>http://schema.org/isVariantOf</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">A pointer to a base product from which this product is a variant. It is safe to infer that the
    ↪   variant inherits all product features from the base model, unless defined locally. This is not transitive.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/itemOffered -->

    <owl:ObjectProperty rdf:about="&s;itemOffered">
        <rdfs:label xml:lang="en">item offered (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/itemOffered</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The item being offered.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/itemReviewed -->

    <owl:ObjectProperty rdf:about="&s;itemReviewed">
        <rdfs:label xml:lang="en">item reviewed (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The item that is being reviewed/rated.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/itemReviewed</rdfs:isDefinedBy>
        <owl:inverseOf rdf:resource="&cameraontology;isSItemReviewedOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;AggregateRating"/>
                    <rdf:Description rdf:about="&s;Review"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://schema.org/language -->

    <owl:ObjectProperty rdf:about="&s;language">
        <rdfs:label xml:lang="en">language (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A sub property of instrument. The language used on this action.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/language</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;Language"/>
        <rdfs:domain rdf:resource="&s;WriteAction"/>
        <rdfs:subPropertyOf rdf:resource="&s;instrument"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/lesser -->

    <owl:ObjectProperty rdf:about="&s;lesser">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">lesser (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/lesser</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is lesser than the
    ↪   object.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/lesserOrEqual -->

    <owl:ObjectProperty rdf:about="&s;lesserOrEqual">
```

```
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">lesser or equal (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/lesserOrEqual</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is lesser than or
    ↪   equal to the object.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/makesOffer -->

    <owl:ObjectProperty rdf:about="&s;makesOffer">
        <rdfs:label xml:lang="en">makes offer (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A pointer to products or services offered by the organization or person.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/makesOffer</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;Offering"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/manufacturer -->

    <owl:ObjectProperty rdf:about="&s;manufacturer">
        <rdfs:label xml:lang="en">manufacturer (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/manufacturer</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The manufacturer of the product.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;BusinessEntity"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:inverseOf rdf:resource="&cameraontology;sManufactures"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/model -->

    <owl:ObjectProperty rdf:about="&s;model">
        <rdfs:label xml:lang="en">model (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/model</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The model of the product. Use with the URL of a ProductModel or a textual representation of
    ↪   the model identifier. The URL of the ProductModel can be from an external source. It is recommended to additionally
    ↪   provide strong product identifiers via the gtin8/gtin13/gtin14 and mpn properties.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://schema.org/nonEqual -->

    <owl:ObjectProperty rdf:about="&s;nonEqual">
        <rdf:type rdf:resource="&owl;SymmetricProperty"/>
        <rdfs:label xml:lang="en">non equal (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">This ordering relation for qualitative values indicates that the subject is not equal to the
    ↪   object.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/nonEqual</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
        <rdfs:range rdf:resource="&gr;QualitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/owns -->

    <owl:ObjectProperty rdf:about="&s;owns">
        <rdfs:label xml:lang="en">owns (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Products owned by the organization or person.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/owns</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;Individual"/>
```

```
        <owl:inverseOf rdf:resource="&cameraontology;isSOwnedBy"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/predecessorOf -->

    <owl:ObjectProperty rdf:about="&s;predecessorOf">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">predecessor of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/predecessorOf</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A pointer from a previous, often discontinued variant of the product to its newer
↪   variant.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/priceSpecification -->

    <owl:ObjectProperty rdf:about="&s;priceSpecification">
        <rdfs:label xml:lang="en">price specification (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">One or more detailed price specifications, indicating the unit price and delivery or payment
↪   charges.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/priceSpecification</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <rdfs:range rdf:resource="&gr;PriceSpecification"/>
        <owl:inverseOf rdf:resource="&cameraontology;isSPriceSpecificationOf"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/review -->

    <owl:ObjectProperty rdf:about="&s;review">
        <rdfs:label xml:lang="en">review (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Creative Work, an Offer, an Organization, or a Product can have a Review.

I.e. A review of the item.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/review</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;Review"/>
        <owl:inverseOf rdf:resource="&cameraontology;isSReviewOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://schema.org/reviewRating -->

    <owl:ObjectProperty rdf:about="&s;reviewRating">
        <rdfs:label xml:lang="en">review rating (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The rating given in this review. Note that reviews can themselves be rated. The
↪   &lt;code&gt;reviewRating&lt;/code&gt; applies to rating given by the review. The &lt;code&gt;aggregateRating&lt;/code&gt;
↪   property applies to the review itself, as a creative work.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/reviewRating</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;Rating"/>
        <rdfs:domain rdf:resource="&s;Review"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOfSReview"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/successorOf -->

    <owl:ObjectProperty rdf:about="&s;successorOf">
        <rdf:type rdf:resource="&owl;TransitiveProperty"/>
        <rdfs:label xml:lang="en">successor of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/successorOf</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A pointer from a newer variant of a product  to its previous, often discontinued
↪   predecessor.</rdfs:comment>
```

```
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:inverseOf rdf:resource="&s;predecessorOf"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/supersededBy -->

    <owl:ObjectProperty rdf:about="&s;supersededBy">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">superseded by (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/supersededBy</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Relates a property to one that supersedes it.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <owl:inverseOf rdf:resource="&cameraontology;SSupersedes"/>
    </owl:ObjectProperty>


    <!-- http://schema.org/thumbnail -->

    <owl:ObjectProperty rdf:about="&s;thumbnail">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">thumbnail (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Thumbnail image for an image or video.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/thumbnail</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;ImageObject"/>
        <owl:equivalentProperty rdf:resource="&foaf;thumbnail"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;ImageObject"/>
                    <rdf:Description rdf:about="&s;VideoObject"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://schema.org/typeOfGood -->

    <owl:ObjectProperty rdf:about="&s;typeOfGood">
        <rdfs:label xml:lang="en">type of good (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The product that this structured value is referring to.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/typeOfGood</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasSTypeOfGood"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://schema.org/valueReference -->

    <owl:ObjectProperty rdf:about="&s;valueReference">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">value reference (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A pointer to a secondary value that provides additional information on the original value,
↪   e.g. a reference temperature.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/valueReference</rdfs:isDefinedBy>
        <owl:inverseOf rdf:resource="&cameraontology;isSValueReferenceOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
```

```
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://schema.org/video -->

    <owl:ObjectProperty rdf:about="&s;video">
        <rdfs:label xml:lang="en">video (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">An embedded video object.

Warning: We enlarged the domain of this property from Creative Work to include Product Or Service, since in the real world just
  ↪    as with s:image every object can have an accompanying video. This adjustment is temporary until this issue is addressed
  ↪    in Schema.org</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/video</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;VideoObject"/>
        <owl:inverseOf rdf:resource="&cameraontology;isSVideoOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://schema.org/weight -->

    <owl:ObjectProperty rdf:about="&s;weight">
        <rdfs:label xml:lang="en">weight (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The weight of the product.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/weight</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://schema.org/width -->

    <owl:ObjectProperty rdf:about="&s;width">
        <rdfs:label xml:lang="en">width (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/width</rdfs:isDefinedBy>
        <rdfs:seeAlso xml:lang="en">The definition of mediaWidth in this ontology.</rdfs:seeAlso>
        <rdfs:comment xml:lang="en">The width of the item.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SSupersedes -->

    <owl:ObjectProperty rdf:about="&cameraontology;SSupersedes">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">s supersedes (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A content file supersedes another content file.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceLensThread -->
```

```
    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceLensThread">
        <rdfs:label xml:lang="en">accessory interface lens thread (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A photo camera with fixed lens, a lens or a filter adapter can have a Lens Thread. This
    ↪   interface is generally used to connect a filter on top of a lens.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceLensThreadGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceLensThreadGender">
        <rdfs:label xml:lang="en">accessory interface lens thread gender (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A lens thread has a gender. If not specified, Female can be assumed.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceMount -->

    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceMount">
        <rdfs:label xml:lang="en">accessory interface mount (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera or mount adapter has an accessory mount.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;MountType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceMountGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceMountGender">
        <rdfs:label xml:lang="en">accessory interface mount gender (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The gender of the mount of the side of the camera (or mount adapter facing the accessory). If
    ↪   not specified, should be Female.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
```

```
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceShoe -->

    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceShoe">
        <rdfs:label xml:lang="en">accessory interface shoe (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera can have an interface shoe.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#accessoryInterfaceShoeGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;accessoryInterfaceShoeGender">
        <rdfs:label xml:lang="en">accessory interface shoe gender (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The gender on the side of the camera (or adapter facing the accessory). If not specified,
  ↪    default should be Female.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#activeZoomRatio -->

    <owl:ObjectProperty rdf:about="&cameraontology;activeZoomRatio">
        <rdfs:label xml:lang="en">active zoom ratio (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The active zoom ratio.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#angleOfView -->

    <owl:ObjectProperty rdf:about="&cameraontology;angleOfView">
        <rdfs:label xml:lang="en">angle of view (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The angle of view in standard mode.

In photography, angle of view (AOV) describes the angular extent of a given scene that is imaged by a camera. It is used
  ↪    interchangeably with the more general term field of view.

It is important to distinguish the angle of view from the angle of coverage, which describes the angle range that a lens can
  ↪    image. Typically the image circle produced by a lens is large enough to cover the film or sensor completely, possibly
  ↪    including some vignetting toward the edge. If the angle of coverage of the lens does not fill the sensor, the image
  ↪    circle will be visible, typically with strong vignetting toward the edge, and the effective angle of view will be limited
  ↪    to the angle of coverage.
```

```
A camera&apos;s angle of view depends not only on the lens, but also on the sensor. Digital sensors are usually smaller than
    ↪ 35mm film, and this causes the lens to have a narrower angle of view than with 35mm film, by a constant factor for each
    ↪ sensor (called the crop factor). In everyday digital cameras, the crop factor can range from around 1 (professional
    ↪ digital SLRs), to 1.6 (mid-market SLRs), to around 3 to 6 for compact cameras. So a standard 50mm lens for 35mm
    ↪ photography acts like a 50mm standard &quot;film&quot; lens even on a professional digital SLR, but would act closer to
    ↪ an 80mm lens (1.6 x 50mm) on many mid-market DSLRs, and the 40 degree angle of view of a standard 50mm lens on a film
    ↪ camera is equivalent to a 28 - 35mm lens on many digital SLRs.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#angleOfViewFullFrame -->

    <owl:ObjectProperty rdf:about="&cameraontology;angleOfViewFullFrame">
        <rdfs:label xml:lang="en">angle of view full frame (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The angle of view in 35mm mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#audioVideoPort -->

    <owl:ObjectProperty rdf:about="&cameraontology;audioVideoPort">
        <rdfs:label xml:lang="en">audio/video port (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The audio/video ports of a device.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;port"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#autoCondition -->

    <owl:ObjectProperty rdf:about="&cameraontology;autoCondition">
        <rdfs:label xml:lang="en">auto condition (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera can have several &apos;auto condition&apos; settings. See the concreate instances
    ↪ for examples.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryInterfaceCapacityNeeded -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryInterfaceCapacityNeeded">
        <rdfs:label xml:lang="en">battery interface capacity needed (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The (minimal) battery capacity needed so that the camera will function. Expressed in mAh
    ↪ (Milliampere per hour).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
```

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1995
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryInterfaceType -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryInterfaceType">
        <rdfs:label xml:lang="en">battery interface type (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera or accessory has a specific battery type it needs in order to function. This type is
    ↪   expressed by &apos;Battery Type&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
2005    <rdfs:range rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
2010                <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
2015    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryInterfaceTypeGender -->
2020
    <owl:ObjectProperty rdf:about="&cameraontology;batteryInterfaceTypeGender">
        <rdfs:label xml:lang="en">battery interface type gender (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The battery interface of a camera has a gender. If not specified, Female can be
    ↪   assumed.</rdfs:comment>
2025    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
2030                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
2035    </rdfs:domain>
    </owl:ObjectProperty>



2040    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryLife -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryLife">
        <rdfs:label xml:lang="en">battery life (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The estimated battery life of a product.</rdfs:comment>
2045    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
2050            <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
2055    </rdfs:domain>
    </owl:ObjectProperty>



2060    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryPowerRequirement -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryPowerRequirement">
        <rdfs:label xml:lang="en">battery power requirement (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
2065    <rdfs:comment xml:lang="en">The min and max battery power requirement (range) needed by the camera in order to function
    ↪   properly. This requirement is expressed in Voltage (V).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
2070
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryType -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryType">
        <rdfs:label xml:lang="en">battery type (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The type of a battery.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:range rdf:resource="&cameraontology;BatteryType"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#batteryTypeGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;batteryTypeGender">
        <rdfs:label xml:lang="en">battery type gender (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The gender of a battery. When this gender is not specified, Male can be
↪   assumed.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#bracketMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;bracketMode">
        <rdfs:label xml:lang="en">bracket mode (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have several bracket modes.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;BracketMode"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#bulb -->

    <owl:ObjectProperty rdf:about="&cameraontology;bulb">
        <rdfs:label xml:lang="en">bulb (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Bulb, abbreviated B, is a shutter speed setting on an adjustable camera that allows for long
↪   exposure times under the direct control of the photographer. With this setting, the shutter simply stays open as long as
↪   the shutter release button remains depressed. An alternative setting common on film cameras is Time, abbreviated T, where
↪   the button is pressed once to open the shutter and again to close it.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#button -->

    <owl:ObjectProperty rdf:about="&cameraontology;button">
        <rdfs:label xml:lang="en">button (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The buttons on a device.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Button"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cableLength -->

    <owl:ObjectProperty rdf:about="&cameraontology;cableLength">
        <rdfs:label xml:lang="en">cable length (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The length of the cable.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
```

```
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cameraDcInVoltage -->

    <owl:ObjectProperty rdf:about="&cameraontology;cameraDcInVoltage">
        <rdfs:label xml:lang="en">camera dc in voltage (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The Voltage, expressed in V, needed by the camera in order to operate.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cameraInterfaceMount -->

    <owl:ObjectProperty rdf:about="&cameraontology;cameraInterfaceMount">
        <rdfs:label xml:lang="en">camera interface mount (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A Mount Adapter or Lens has a camera interface mount.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;MountType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cameraInterfaceMountGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;cameraInterfaceMountGender">
        <rdfs:label xml:lang="en">camera interface mount gender (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The gender of the mount on the accessory. If not specified, default should be
↪   Male.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cameraInterfaceShoe -->

    <owl:ObjectProperty rdf:about="&cameraontology;cameraInterfaceShoe">
        <rdfs:label xml:lang="en">camera interface shoe (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A Shoe Adapter has both a camera interface shoe which connects the shoe adapter to the camera
↪   and a accessory interface shoe for connection with a peripheral device.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cameraInterfaceShoeGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;cameraInterfaceShoeGender">
        <rdfs:label xml:lang="en">camera interface shoe gender (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The gender of the shoe on the accessory. If not specified, default should be
↪   Male.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#clearImage4kZoom -->

    <owl:ObjectProperty rdf:about="&cameraontology;clearImage4kZoom">
        <rdfs:label xml:lang="en">clear image 4k zoom (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The clear image zoom in 4k mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#clearImageZoom -->

    <owl:ObjectProperty rdf:about="&cameraontology;clearImageZoom">
        <rdfs:label xml:lang="en">clear image zoom (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The clear image zoom factor.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#colorSpaceSetting -->

    <owl:ObjectProperty rdf:about="&cameraontology;colorSpaceSetting">
        <rdfs:label xml:lang="en">color space setting (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Cameras can have several &apos;color space setting&apos; settings.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;ColorSpaceSetting"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#continuousFlash -->

    <owl:ObjectProperty rdf:about="&cameraontology;continuousFlash">
        <rdfs:label xml:lang="en">continuous flash (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The number of seconds the flash can operate in one burst.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>
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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#continuousFlashTotal -->

    <owl:ObjectProperty rdf:about="&cameraontology;continuousFlashTotal">
        <rdfs:label xml:lang="en">continuous flash total (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The total number of seconds that the flash can operate, spread over several
    ↪   bursts.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#cordLength -->

    <owl:ObjectProperty rdf:about="&cameraontology;cordLength">
        <rdfs:label xml:lang="en">cord length (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The cord length, expressed in millimeter, if the camera or accessory has a
    ↪   cord.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#creativeStyleColorMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;creativeStyleColorMode">
        <rdfs:label xml:lang="en">creative style color mode (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have different &apos;creative style color mode&apos; settings.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#dataPort -->

    <owl:ObjectProperty rdf:about="&cameraontology;dataPort">
        <rdfs:label xml:lang="en">data port (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The data ports of a device.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;Data"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;port"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#describes -->

    <owl:ObjectProperty rdf:about="&cameraontology;describes">
        <rdfs:label xml:lang="en">describes (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A comparible instance of the class.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain>
            <owl:Class>
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            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&dcterms;AgentClass"/>
                <rdf:Description rdf:about="&s;Intangible"/>
                <rdf:Description rdf:about="&eco;C_AKJ313002-tax"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#digitalZoom -->

<owl:ObjectProperty rdf:about="&cameraontology;digitalZoom">
    <rdfs:label xml:lang="en">digital zoom (0..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The digital zoom factor.</rdfs:comment>
    <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#directionalAngleRange -->

<owl:ObjectProperty rdf:about="&cameraontology;directionalAngleRange">
    <rdfs:label xml:lang="en">directional angle range (0..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The directional angle range of a speaker or microphone.</rdfs:comment>
    <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN887003-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#displayDiagonalSize -->

<owl:ObjectProperty rdf:about="&cameraontology;displayDiagonalSize">
    <rdfs:label xml:lang="en">display diagonal size (0..1)</rdfs:label>
    <rdfs:comment xml:lang="en">The diagonal size of the display. Expressed in centimetre.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#elevatorStroke -->

<owl:ObjectProperty rdf:about="&cameraontology;elevatorStroke">
    <rdfs:label xml:lang="en">elevator stroke (1..1)</rdfs:label>
    <rdfs:comment xml:lang="en">The elevator stroke of a Tripod.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#extendedZoom -->

<owl:ObjectProperty rdf:about="&cameraontology;extendedZoom">
    <rdfs:label xml:lang="en">extended zoom (0..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The extended zoom factor.</rdfs:comment>
    <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#eyeCupType -->

<owl:ObjectProperty rdf:about="&cameraontology;eyeCupType">
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        <rdfs:label xml:lang="en">eye-cup type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The type of eye-cup. Currently only the type &apos;A&apos; is specified.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;EyeCupType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#eyeCupTypeGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;eyeCupTypeGender">
        <rdfs:label xml:lang="en">eye-cup type gender (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The gender of the eye-cup type. If gender is not specified, Male can be
↪   assumed.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#faceDetection -->

    <owl:ObjectProperty rdf:about="&cameraontology;faceDetection">
        <rdfs:label xml:lang="en">face detection (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera can have different &apos;face detection&apos; settings.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#faceDetectionFeature -->

    <owl:ObjectProperty rdf:about="&cameraontology;faceDetectionFeature">
        <rdfs:label xml:lang="en">face detection feature (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have different &apos;face detection feature&apos; settings.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;FaceDetectionFeature"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#faceDetectionNumber -->

    <owl:ObjectProperty rdf:about="&cameraontology;faceDetectionNumber">
        <rdfs:label xml:lang="en">face detection number (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The number of faces the face detection system can detect.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#fixedEyeLevelSystem -->
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    <owl:ObjectProperty rdf:about="&cameraontology;fixedEyeLevelSystem">
        <rdfs:label xml:lang="en">fixed eyelevel system (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property describes the fixed eye-level system of a viewfinder.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;FixedEyeLevelSystem"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashCompensationRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashCompensationRange">
        <rdfs:label xml:lang="en">flash compensation range (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Flash Compensation, expressed in EV (Elektronvolt).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashCompensationStep -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashCompensationStep">
        <rdfs:label xml:lang="en">flash compensation step (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The step in the compensation range. Also expressed in EV.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashCoverage -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashCoverage">
        <rdfs:label xml:lang="en">flash coverage (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The angle of view coverage of the flash, expressed in millimetre. Known values include
    ↪   &apos;16mm&apos; and &apos;18mm&apos;.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashGuideNumber -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashGuideNumber">
        <rdfs:label xml:lang="en">flash guide number (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The built-in-Flash Guide Number (in meters at ISO 100).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
```

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        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashMode">
        <rdfs:label xml:lang="en">flash mode (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The supported &apos;Flash Mode&apos;s of a Camera or Flash device.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;FlashMode"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashRecyclingTime -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashRecyclingTime">
        <rdfs:label xml:lang="en">flash recycling time (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The built-in-Flash Recycling Time (approx. time in seconds).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashSyncSpeed -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashSyncSpeed">
        <rdfs:label xml:lang="en">flash sync speed (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The normal synchronisation speed of the flash, with respect to the shutter.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashSyncSpeedSteadyOff -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashSyncSpeedSteadyOff">
        <rdfs:label xml:lang="en">flash sync speed steadyshot off (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The synchronisation speed of the flash, with respect to the shutter when steadyshot is
    ↪   turned off.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashSyncSpeedSteadyOn -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashSyncSpeedSteadyOn">
        <rdfs:label xml:lang="en">flash sync speed steadyshot on (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The synchronisation speed of the flash, with respect to the shutter when steadyshot is
    ↪   turned on.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashTeleRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashTeleRange">
        <rdfs:label xml:lang="en">flash tele range (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The tele range of the flash.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#flashWideRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;flashWideRange">
        <rdfs:label xml:lang="en">flash wide range (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The wide range of the flash.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#focalLength -->

    <owl:ObjectProperty rdf:about="&cameraontology;focalLength">
        <rdfs:label xml:lang="en">focal length (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The focal length of the lens. The minimal value represents &amp;apos;Wide&amp;apos;, and the maximal
    ↪   value represents &amp;apos;Tele&amp;apos;.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#focalLengthMovieStandard -->

    <owl:ObjectProperty rdf:about="&cameraontology;focalLengthMovieStandard">
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```
        <rdfs:label xml:lang="en">focal length movie standard (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The focal length 35mm equivalent in movie mode (standard).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#focalLengthMovieWide -->

    <owl:ObjectProperty rdf:about="&cameraontology;focalLengthMovieWide">
        <rdfs:label xml:lang="en">focal length movie wide (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The focal length 35mm equivalent in movie mode (wide).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#focalLengthPhotoStandard -->

    <owl:ObjectProperty rdf:about="&cameraontology;focalLengthPhotoStandard">
        <rdfs:label xml:lang="en">focal length photo standard (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The focal length 35mm equivalent in photo mode (standard).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#focalLengthPhotoWide -->

    <owl:ObjectProperty rdf:about="&cameraontology;focalLengthPhotoWide">
        <rdfs:label xml:lang="en">focal length photo wide (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The focal length 35mm equivalent in photo mode (wide).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#grBrands -->
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    <owl:ObjectProperty rdf:about="&cameraontology;grBrands">
        <rdfs:label xml:lang="en">gr brands (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A brands &apos;brands&apos; a Product or a service and &apos;brands&apos; a Business
↪   Entity</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;Brand"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;productBrands"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;sBrands"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#grManufactures -->

    <owl:ObjectProperty rdf:about="&cameraontology;grManufactures">
        <rdfs:label xml:lang="en">gr manufactures (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Business Entity manufactures a Product or Service</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;sManufactures"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#gripType -->

    <owl:ObjectProperty rdf:about="&cameraontology;gripType">
        <rdfs:label xml:lang="en">grip type (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The type of grip. Currently only the type &apos;A7&apos; is specified.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;GripType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#gripTypeGender -->

    <owl:ObjectProperty rdf:about="&cameraontology;gripTypeGender">
        <rdfs:label xml:lang="en">grip type gender (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The gender of the grip type. If gender is not specified, Male can be assumed.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Gender"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#guestInterfaceMemoryCardType -->

    <owl:ObjectProperty rdf:about="&cameraontology;guestInterfaceMemoryCardType">
        <rdfs:label xml:lang="en">guest interface memory card type (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interface type of either the camera, or the memory card type of the adapter that faces
↪   (connects to) the guest device, i.e. the actual memory card.</rdfs:comment>
```

```
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;MemoryCardType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MemoryCardAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasContentFile -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasContentFile">
        <rdfs:label xml:lang="en">has content file (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A product or service model has zero or more associated content files.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasContentSubType -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasContentSubType">
        <rdfs:label xml:lang="en">has content subtype (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a content type has some content subtype.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;ContentSubType"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentType"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasDcContributed -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasDcContributed">
        <rdfs:label xml:lang="en">has dc contributed (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; contributor.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dc;contributor"/>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasDctContributed"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSContributed"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasDcCreated -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasDcCreated">
        <rdfs:label xml:lang="en">has dc created (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; creator.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dc;creator"/>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasDctCreated"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSCreated"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;made"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasDctContributed -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasDctContributed">
        <rdfs:label xml:lang="en">has dct contributed (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; contributor.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dcterms;contributor"/>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;hasDcContributed"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSContributed"/>
```

```
        <rdfs:domain rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasDctCreated -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasDctCreated">
        <rdfs:label xml:lang="en">has dct created (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core terms&apos; creator.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dcterms;creator"/>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;hasDcCreated"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;hasDctContributed"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSCreated"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;made"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasGrAccessoryOrSparePart -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasGrAccessoryOrSparePart">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has gr accessory or spare part (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product or Service has a accessory or Spare Part for another Product or
↪   Service</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSAccessoryOrSparePart"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasGrConsumable -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasGrConsumable">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has gr consumable (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product or Service can have consumables.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSConsumable"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasGrTypeAndQuantityNode -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasGrTypeAndQuantityNode">
        <rdfs:label xml:lang="en">has gr type and quantity node (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Individual or Some Items can have Type Of Quantity Nodes associated with
↪   them</rdfs:comment>
        <rdfs:range rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSTypeOfGood"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasGrVariant -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasGrVariant">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
```

```
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has gr variant (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Product or Service Model has a variant in another Product or Service Model</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;hasSVariant"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasProductCategory -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasProductCategory">
        <rdfs:label xml:lang="en">has product category (1..*)</rdfs:label>
        <rdfs:comment xml:lang="en">a product type has some associated product categories.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&cameraontology;ProductCategory"/>
        <rdfs:domain rdf:resource="&cameraontology;ProductType"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasProductModel -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasProductModel">
        <rdfs:label xml:lang="en">has product model (1..*)</rdfs:label>
        <rdfs:comment xml:lang="en">a product series has some product models.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:domain rdf:resource="&cameraontology;ProductSeries"/>
        <owl:inverseOf rdf:resource="&cameraontology;isOfProductSeries"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasProductSeries -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasProductSeries">
        <rdfs:label xml:lang="en">has product series (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product subcategory has some product series.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;ProductSeries"/>
        <rdfs:domain rdf:resource="&cameraontology;ProductSubCategory"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasProductSubCategory -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasProductSubCategory">
        <rdfs:label xml:lang="en">has product subcategory (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product category has some product subcategories.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ProductCategory"/>
        <rdfs:range rdf:resource="&cameraontology;ProductSubCategory"/>
        <owl:inverseOf rdf:resource="&cameraontology;isProductSubCategoryOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSAccessoryOrSparePart -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSAccessoryOrSparePart">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has s accessory or spare part (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product can have Accessories or Spare Parts.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSConsumable -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSConsumable">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
```

```
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has s consumable (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Product can have consumables.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSContributed -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSContributed">
        <rdfs:label xml:lang="en">has s contributed (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Organization or Person has contributed to a Creative Work.</rdfs:comment>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSCreated -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSCreated">
        <rdfs:label xml:lang="en">has s created (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Organization or Person creates a Creative Work.</rdfs:comment>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <owl:inverseOf rdf:resource="&s;creator"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
        <owl:equivalentProperty rdf:resource="&foaf;made"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSTypeOfGood -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSTypeOfGood">
        <rdfs:label xml:lang="en">has s type of good (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A product can have an associated type and quantity node.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;TypeAndQuantityNode"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasSVariant -->

    <owl:ObjectProperty rdf:about="&cameraontology;hasSVariant">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">has s variant (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product Model can have some variants.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:inverseOf rdf:resource="&s;isVariantOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hostInterfaceMemoryCardType -->

    <owl:ObjectProperty rdf:about="&cameraontology;hostInterfaceMemoryCardType">
        <rdfs:label xml:lang="en">host interface memory card type (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interface type of either the memory card, or the memory card type of the adapter that
    ↪   faces (connects to) the host device.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
```

```
        <rdfs:range rdf:resource="&cameraontology;MemoryCardType"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MemoryCardAdapterGeneric"/>
                    <rdf:Description rdf:about="&cameraontology;MemoryCardGeneric"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#imageBurstRate -->

    <owl:ObjectProperty rdf:about="&cameraontology;imageBurstRate">
        <rdfs:label xml:lang="en">image burst rate (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The image burst rate of a camera. Expressed in images per second.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#infopage -->

    <owl:ObjectProperty rdf:about="&cameraontology;infopage">
        <rdfs:label xml:lang="en">infopage (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A content file can have an associated infopage.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&foaf;Document"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;page"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#intelligentAutoRecognitionScene -->

    <owl:ObjectProperty rdf:about="&cameraontology;intelligentAutoRecognitionScene">
        <rdfs:label xml:lang="en">intelligent auto recognition scene (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have different &apos;intelligent auto recognition scene&apos;
↪   settings.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#interiorDepth -->

    <owl:ObjectProperty rdf:about="&cameraontology;interiorDepth">
        <rdfs:label xml:lang="en">interior depth (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interior depth of a bag or case. This property determines whether or not a device, e.g. a
↪   camera, fits inside.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN894002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#interiorHeight -->

    <owl:ObjectProperty rdf:about="&cameraontology;interiorHeight">
        <rdfs:label xml:lang="en">interior height (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interior height of a bag or case. This property determines whether or not a device, e.g.
↪   a camera, fits inside.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN894002-gen"/>
    </owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#interiorWidth -->

    <owl:ObjectProperty rdf:about="&cameraontology;interiorWidth">
        <rdfs:label xml:lang="en">interior width (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The interior width of a bag or case. This property determines whether or not a device, e.g. a
    ↪   camera, fits inside.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN894002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#inverseDcRelation -->

    <owl:ObjectProperty rdf:about="&cameraontology;inverseDcRelation">
        <rdfs:label xml:lang="en">inverse dc relation (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; relation.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&cameraontology;inverseDctRelation"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#inverseDctRelation -->

    <owl:ObjectProperty rdf:about="&cameraontology;inverseDctRelation">
        <rdfs:label xml:lang="en">inverse dct relation (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core terms&apos; relation.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dcterms;relation"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;inverseDcRelation"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceLensThreadGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceLensThreadGenderOf">
        <rdfs:label xml:lang="en">is accessory interface lens thread gender of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface lens thread gender&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceLensThreadGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceLensThreadOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceLensThreadOf">
        <rdfs:label xml:lang="en">is accessory interface lens thread of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface lens thread&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceLensThread"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
```

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                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceMountGenderOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceMountGenderOf">
    <rdfs:label xml:lang="en">is accessory interface mount gender of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface mount gender&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&cameraontology;Gender"/>
    <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceMountGender"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceMountOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceMountOf">
    <rdfs:label xml:lang="en">is accessory interface mount of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface mount&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&cameraontology;MountType"/>
    <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceMount"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceShoeGenderOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceShoeGenderOf">
    <rdfs:label xml:lang="en">is accessory interface shoe gender of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface shoe gender&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&cameraontology;Gender"/>
    <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceShoeGender"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAccessoryInterfaceShoeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isAccessoryInterfaceShoeOf">
    <rdfs:label xml:lang="en">is accessory interface shoe of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;accessory interface shoe&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&cameraontology;ShoeType"/>
    <owl:inverseOf rdf:resource="&cameraontology;accessoryInterfaceShoe"/>
```

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        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isActiveZoomRatioOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isActiveZoomRatioOf">
        <rdfs:label xml:lang="en">is active zoom ratio of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;active zoom ratio&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;activeZoomRatio"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAngleOfViewFullFrameOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAngleOfViewFullFrameOf">
        <rdfs:label xml:lang="en">is angle of view full frame of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;angle of view full frame&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;angleOfViewFullFrame"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAngleOfViewOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAngleOfViewOf">
        <rdfs:label xml:lang="en">is angle of view of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;angle of view&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;angleOfView"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAudioVideoPortOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAudioVideoPortOf">
        <rdfs:label xml:lang="en">is audio/video port of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;audio/video port&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;AudioVideo"/>
        <owl:inverseOf rdf:resource="&cameraontology;audioVideoPort"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isPortOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
```

```
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isAutoConditionOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isAutoConditionOf">
        <rdfs:label xml:lang="en">is auto condition of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;auto condition&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;AutoCondition"/>
        <owl:inverseOf rdf:resource="&cameraontology;autoCondition"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryInterfaceCapacityNeededOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryInterfaceCapacityNeededOf">
        <rdfs:label xml:lang="en">is battery interface capacity needed of (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery interface capacity needed&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryInterfaceCapacityNeeded"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryInterfaceTypeGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryInterfaceTypeGenderOf">
        <rdfs:label xml:lang="en">is battery interface type gender of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery interface type gender&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryInterfaceTypeGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryInterfaceTypeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryInterfaceTypeOf">
        <rdfs:label xml:lang="en">is battery interface type of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery interface type&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;BatteryType"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryInterfaceType"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryLifeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryLifeOf">
```

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        <rdfs:label xml:lang="en">is battery life of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery life&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryLife"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryPowerRequirementOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryPowerRequirementOf">
        <rdfs:label xml:lang="en">is battery power requirement of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery power requirement&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryPowerRequirement"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryTypeGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryTypeGenderOf">
        <rdfs:label xml:lang="en">is battery type gender of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery type gender&apos;.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryTypeGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBatteryTypeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBatteryTypeOf">
        <rdfs:label xml:lang="en">is battery type of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery type&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:domain rdf:resource="&cameraontology;BatteryType"/>
        <owl:inverseOf rdf:resource="&cameraontology;batteryType"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBracketModeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBracketModeOf">
        <rdfs:label xml:lang="en">is bracket mode of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;bracket mode&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;BracketMode"/>
        <owl:inverseOf rdf:resource="&cameraontology;bracketMode"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBulbOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isBulbOf">
        <rdfs:label xml:lang="en">is bulb of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;bulb&apos;.</rdfs:comment>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;bulb"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isButtonOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isButtonOf">
        <rdfs:label xml:lang="en">is button of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;button&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Button"/>
        <owl:inverseOf rdf:resource="&cameraontology;button"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCableLengthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCableLengthOf">
        <rdfs:label xml:lang="en">is cable length of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;cable length&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;cableLength"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraBatteryOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraBatteryOf">
        <rdfs:domain rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraDcInVoltageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraDcInVoltageOf">
        <rdfs:label xml:lang="en">is camera dc in voltage of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;camera dc in voltage&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;cameraDcInVoltage"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraInterfaceMountGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraInterfaceMountGenderOf">
        <rdfs:label xml:lang="en">is camera interface mount gender of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;camera interface mount gender&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;cameraInterfaceMountGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraInterfaceMountOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraInterfaceMountOf">
        <rdfs:label xml:lang="en">is camera interface mount of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;camera interface mount&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;MountType"/>
        <owl:inverseOf rdf:resource="&cameraontology;cameraInterfaceMount"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;MountAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraInterfaceShoeGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraInterfaceShoeGenderOf">
        <rdfs:label xml:lang="en">is camera interface shoe gender of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;camera interface shoe gender&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;cameraInterfaceShoeGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCameraInterfaceShoeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCameraInterfaceShoeOf">
        <rdfs:label xml:lang="en">is camera interface shoe of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;camera interface shoe&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ShoeType"/>
        <owl:inverseOf rdf:resource="&cameraontology;cameraInterfaceShoe"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ShoeAdapterGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isClearImage4kZoomOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isClearImage4kZoomOf">
        <rdfs:label xml:lang="en">is clear image 4k zoom of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;clear image 4k zoom&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;clearImage4kZoom"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isClearImageZoomOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isClearImageZoomOf">
        <rdfs:label xml:lang="en">is clear image zoom of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;clear image zoom&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;clearImageZoom"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isColorSpaceSettingOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isColorSpaceSettingOf">
        <rdfs:label xml:lang="en">is color space setting of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;color space setting&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;ColorSpaceSetting"/>
        <owl:inverseOf rdf:resource="&cameraontology;colorSpaceSetting"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isContentFileOfModel -->

    <owl:ObjectProperty rdf:about="&cameraontology;isContentFileOfModel">
        <rdfs:label xml:lang="en">is content file of model (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A content file belongs to zero or more product or service models.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasContentFile"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isContentSubTypeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isContentSubTypeOf">
        <rdfs:label xml:lang="en">is content subtype of (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a content subtype belongs to some content type.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ContentSubType"/>
        <rdfs:range rdf:resource="&cameraontology;ContentType"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasContentSubType"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isContinuousFlashOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isContinuousFlashOf">
        <rdfs:label xml:lang="en">is continuous flash of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;continuous flash&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;continuousFlash"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isContinuousFlashTotalOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isContinuousFlashTotalOf">
        <rdfs:label xml:lang="en">is continuous flash total of (0..*)</rdfs:label>
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```
        <rdfs:comment xml:lang="en">The inverse of &apos;continuous flash total&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;continuousFlashTotal"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCordLengthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCordLengthOf">
        <rdfs:label xml:lang="en">is cord length of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;cord length&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;cordLength"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isCreativeStyleColorModeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isCreativeStyleColorModeOf">
        <rdfs:label xml:lang="en">is creative style color mode of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;creative style color mode&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <owl:inverseOf rdf:resource="&cameraontology;creativeStyleColorMode"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDataPortOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDataPortOf">
        <rdfs:label xml:lang="en">is data port of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;data port&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Data"/>
        <owl:inverseOf rdf:resource="&cameraontology;dataPort"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isPortOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDcFormatOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDcFormatOf">
        <rdfs:label xml:lang="en">is dc format of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; format.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dc;format"/>
        <rdfs:domain rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isDctFormatOf"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDcLanguageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDcLanguageOf">
        <rdfs:label xml:lang="en">is dc language of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core&apos; language.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dc;language"/>
        <rdfs:domain rdf:resource="&s;Language"/>
        <rdfs:range rdf:resource="&s;WriteAction"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isDctLanguageOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSLanguageOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDctExtentOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDctExtentOf">
        <rdfs:label xml:lang="en">is dct extent of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core terms&apos; extent.</rdfs:comment>
        <rdfs:domain rdf:resource="&dcterms;SizeOrDuration"/>
        <owl:inverseOf rdf:resource="&dcterms;extent"/>
        <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isDcFormatOf"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isDctFormatOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDctFormatOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDctFormatOf">
        <rdfs:label xml:lang="en">is dct format of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core terms&apos; contributor.</rdfs:comment>
        <rdfs:domain rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <owl:inverseOf rdf:resource="&dcterms;format"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isDcFormatOf"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDctLanguageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDctLanguageOf">
        <rdfs:label xml:lang="en">is dct language of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">inverse of &apos;dublin core terms&apos; language.</rdfs:comment>
        <owl:inverseOf rdf:resource="&dcterms;language"/>
        <rdfs:domain rdf:resource="&s;Language"/>
        <rdfs:range rdf:resource="&s;WriteAction"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isDcLanguageOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSLanguageOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDescribedBy -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDescribedBy">
        <rdfs:label xml:lang="en">is described by (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;describes&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:inverseOf rdf:resource="&cameraontology;describes"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&dcterms;AgentClass"/>
                    <rdf:Description rdf:about="&s;Intangible"/>
                    <rdf:Description rdf:about="&eco;C_AKJ313002-tax"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDigitalZoomOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDigitalZoomOf">
        <rdfs:label xml:lang="en">is digital zoom of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;digital zoom&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;digitalZoom"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDirectFilterOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDirectFilterOf">
        <rdfs:domain rdf:resource="&eco;C_AKN892002-gen"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDirectFlashOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDirectFlashOf">
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:domain rdf:resource="&eco;C_AKN888002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDirectLensOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDirectLensOf">
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDirectionalAngleRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDirectionalAngleRangeOf">
        <rdfs:label xml:lang="en">is directional angle range of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;directional angle range&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <owl:inverseOf rdf:resource="&cameraontology;directionalAngleRange"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN887003-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isDisplayDiagonalSizeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isDisplayDiagonalSizeOf">
        <rdfs:label xml:lang="en">is display diagonal size of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;display diagonal size&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;displayDiagonalSize"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isEcoBatteryCapacityOf -->
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    <owl:ObjectProperty rdf:about="&cameraontology;isEcoBatteryCapacityOf">
        <rdfs:label xml:lang="en">is eco battery capacity of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;battery capacity&apos;, as specified by eClassOWL.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:range rdf:resource="&cameraontology;BatteryGeneric"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&eco;P_BAA564001"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isEcoConstructionFormOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isEcoConstructionFormOf">
        <rdfs:label xml:lang="en">is eco construction form of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;construction form&apos;, as defined by eClassOWL.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;CameraType"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
        <owl:inverseOf rdf:resource="&eco;P_BAG977001"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isElevatorStrokeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isElevatorStrokeOf">
        <rdfs:label xml:lang="en">is elevator stroke of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;elevator stroke&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;elevatorStroke"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isExtendedZoomOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isExtendedZoomOf">
        <rdfs:label xml:lang="en">is extended zoom of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;extended zoom&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;extendedZoom"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isEyeCupTypeGenderOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isEyeCupTypeGenderOf">
        <rdfs:label xml:lang="en">is eye-cup type gender of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;eye-cup type gender&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
        <owl:inverseOf rdf:resource="&cameraontology;eyeCupTypeGender"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isEyeCupTypeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isEyeCupTypeOf">
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        <rdfs:label xml:lang="en">is eye-cup type of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;eye-cup type&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;EyeCupType"/>
        <owl:inverseOf rdf:resource="&cameraontology;eyeCupType"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFaceDetectionFeatureOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFaceDetectionFeatureOf">
        <rdfs:label xml:lang="en">is face detection feature of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;face detection feature&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;FaceDetectionFeature"/>
        <owl:inverseOf rdf:resource="&cameraontology;faceDetectionFeature"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFaceDetectionNumberOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFaceDetectionNumberOf">
        <rdfs:label xml:lang="en">is face detection number of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;face detection number&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <owl:inverseOf rdf:resource="&cameraontology;faceDetectionNumber"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFaceDetectionOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFaceDetectionOf">
        <rdfs:label xml:lang="en">is face detection of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;face detection&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;FaceDetection"/>
        <owl:inverseOf rdf:resource="&cameraontology;faceDetection"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFixedEyeLevelSystemOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFixedEyeLevelSystemOf">
        <rdfs:label xml:lang="en">is fixed eyelevel system of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;fixed eyelevel system&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;FixedEyeLevelSystem"/>
        <owl:inverseOf rdf:resource="&cameraontology;fixedEyeLevelSystem"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashCompensationRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashCompensationRangeOf">
        <rdfs:label xml:lang="en">is flash compensation range of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash compensation range&apos;.</rdfs:comment>
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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashCompensationRange"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashCompensationStepOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashCompensationStepOf">
        <rdfs:label xml:lang="en">is flash compensation step of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash compensation step&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashCompensationStep"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashCoverageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashCoverageOf">
        <rdfs:label xml:lang="en">is flash coverage of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash coverage&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashCoverage"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashGuideNumberOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashGuideNumberOf">
        <rdfs:label xml:lang="en">is flash guide number of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash guide number&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashGuideNumber"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashModeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashModeOf">
        <rdfs:label xml:lang="en">is flash mode of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash mode&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;FlashMode"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashMode"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashRecyclingTimeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashRecyclingTimeOf">
        <rdfs:label xml:lang="en">is flash recycling time of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash recycling time&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashRecyclingTime"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashSyncSpeedOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashSyncSpeedOf">
        <rdfs:label xml:lang="en">is flash sync speed of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash sync speed&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashSyncSpeed"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashSyncSpeedSteadyOffOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashSyncSpeedSteadyOffOf">
        <rdfs:label xml:lang="en">is flash sync speed stready off of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash sync speed steadyshot off&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashSyncSpeedSteadyOff"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashSyncSpeedSteadyOnOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashSyncSpeedSteadyOnOf">
        <rdfs:label xml:lang="en">is flash sync speed stready on of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash sync speed steadyshot on&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashSyncSpeedSteadyOn"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
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        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashTeleRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashTeleRangeOf">
        <rdfs:label xml:lang="en">is flash tele range of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash tele range&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashTeleRange"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFlashWideRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFlashWideRangeOf">
        <rdfs:label xml:lang="en">is flash wide range of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;flash wide range&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;flashWideRange"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFoafHomepageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFoafHomepageOf">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">is foaf homepage of (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A document is the homepage of a Thing.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Document"/>
        <owl:inverseOf rdf:resource="&foaf;homepage"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;primaryTopic"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;topic"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFoafThumbnailOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFoafThumbnailOf">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is foaf thumbnail of (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">An image can be the thumbnail of another image or video.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;ImageObject"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSThumbnailOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;ImageObject"/>
                    <rdf:Description rdf:about="&s;VideoObject"/>
                </owl:unionOf>
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            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFocalLengthMovieStandardOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFocalLengthMovieStandardOf">
        <rdfs:label xml:lang="en">is focal length movie standard of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;focal length movie standard&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;focalLengthMovieStandard"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFocalLengthMovieWideOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFocalLengthMovieWideOf">
        <rdfs:label xml:lang="en">is focal length movie wide of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;focal length movie wide&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;focalLengthMovieWide"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFocalLengthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFocalLengthOf">
        <rdfs:label xml:lang="en">is focal length of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;focal length&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;focalLength"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFocalLengthPhotoStandardOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFocalLengthPhotoStandardOf">
        <rdfs:label xml:lang="en">is focal length photo standard of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;focal length photo standard&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;focalLengthPhotoStandard"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
```

```
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isFocalLengthPhotoWideOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isFocalLengthPhotoWideOf">
        <rdfs:label xml:lang="en">is focal length photo wide of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;focal length photo wide&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <owl:inverseOf rdf:resource="&cameraontology;focalLengthPhotoWide"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrDepthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrDepthOf">
        <rdfs:label xml:lang="en">is gr depth of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;depth&apos; as defined by GoodRelations.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSDepthOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrEligibleQuantityOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrEligibleQuantityOf">
        <rdfs:label xml:lang="en">is gr eligible quantity of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A quantitative value is an eligible quantity of an offering or a price
↪   specification.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&gr;hasEligibleQuantity"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSEligibleQuantityOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;PriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrHeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrHeightOf">
        <rdfs:label xml:lang="en">is gr height of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;height&apos;, as defined by GoodRelations.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSHeightOf"/>
    </owl:ObjectProperty>
```

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4735
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrIncludedIn -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGrIncludedIn">
4740        <rdfs:label xml:lang="en">is gr included in (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A Product Or Service is included in an Offering</rdfs:comment>
            <rdfs:range rdf:resource="&gr;Offering"/>
            <rdfs:domain rdf:resource="&gr;ProductOrService"/>
4745        <owl:equivalentProperty rdf:resource="&cameraontology;isSItemOfferedIn"/>
        </owl:ObjectProperty>



4750    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrMakeAndModelOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGrMakeAndModelOf">
            <rdfs:label xml:lang="en">is gr make and model of (0..*)</rdfs:label>
            <rdfs:comment xml:lang="en">The make and model of either an Individual or Some Items</rdfs:comment>
4755        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
            <owl:inverseOf rdf:resource="&gr;hasMakeAndModel"/>
            <owl:equivalentProperty rdf:resource="&cameraontology;isSModelOf"/>
            <rdfs:range>
4760            <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&gr;Individual"/>
                        <rdf:Description rdf:about="&gr;SomeItems"/>
                    </owl:unionOf>
4765            </owl:Class>
            </rdfs:range>
        </owl:ObjectProperty>


4770
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrOfferedBy -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGrOfferedBy">
            <rdfs:label xml:lang="en">is gr offered by (0..1)</rdfs:label>
4775        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">An Offering Is Offered By a Business Entity</rdfs:comment>
            <rdfs:range rdf:resource="&gr;BusinessEntity"/>
            <rdfs:domain rdf:resource="&gr;Offering"/>
            <owl:equivalentProperty rdf:resource="&cameraontology;isSOfferedBy"/>
4780    </owl:ObjectProperty>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrOwnedBy -->
4785
        <owl:ObjectProperty rdf:about="&cameraontology;isGrOwnedBy">
            <rdfs:label xml:lang="en">is gr owned by (0..1)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">An Individual is owned by zero or one Business Entity</rdfs:comment>
4790        <rdfs:range rdf:resource="&gr;BusinessEntity"/>
            <rdfs:domain rdf:resource="&gr;Individual"/>
            <owl:equivalentProperty rdf:resource="&cameraontology;isSOwnedBy"/>
        </owl:ObjectProperty>

4795

        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrPriceSpecificationOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGrPriceSpecificationOf">
4800        <rdfs:label xml:lang="en">is gr price specification of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A Price Specification is a price specification of an Offering</rdfs:comment>
            <rdfs:range rdf:resource="&gr;Offering"/>
            <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
4805        <owl:equivalentProperty rdf:resource="&cameraontology;isSPriceSpecificationOf"/>
        </owl:ObjectProperty>



4810    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrQualitativeProductOrServicePropertyOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGrQualitativeProductOrServicePropertyOf">
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        <rdfs:label xml:lang="en">is gr qualitative product or service property of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Qualitative Value is a Qualitative Product Or Service Property of a Product Or
    ↪   Service</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QualitativeValue"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrQuantitativeProductOrServicePropertyOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrQuantitativeProductOrServicePropertyOf">
        <rdfs:label xml:lang="en">is gr quantitative product or service property of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Quantitative Value is a Quantitative Product Or Service Property of a Product Or
    ↪   Service</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrValueReferenceOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrValueReferenceOf">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is gr value reference of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Is a Value Reference Of either a Quantitative or Qualitative Value.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSValueReferenceOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrWeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrWeightOf">
        <rdfs:label xml:lang="en">is gr weight of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;weight&apos;, as defined by GoodRelations.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isProductWeightOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSWeightOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGrWidthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isGrWidthOf">
        <rdfs:label xml:lang="en">is gr width of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;width&apos;, as defined by GoodRelations.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSWidthOf"/>
    </owl:ObjectProperty>
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4890
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGripTypeGenderOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isGripTypeGenderOf">
4895        <rdfs:label xml:lang="en">is grip type gender of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;grip type gender&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&cameraontology;Gender"/>
            <owl:inverseOf rdf:resource="&cameraontology;gripTypeGender"/>
4900        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
            <rdfs:range>
                <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
4905                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    </owl:unionOf>
                </owl:Class>
            </rdfs:range>
        </owl:ObjectProperty>
4910


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGripTypeOf -->

4915    <owl:ObjectProperty rdf:about="&cameraontology;isGripTypeOf">
            <rdfs:label xml:lang="en">is grip type of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;grip type&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&cameraontology;GripType"/>
4920        <owl:inverseOf rdf:resource="&cameraontology;gripType"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
            <rdfs:range>
                <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
4925                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                        <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                    </owl:unionOf>
                </owl:Class>
            </rdfs:range>
4930    </owl:ObjectProperty>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isGuestInterfaceMemoryCardTypeOf -->
4935
        <owl:ObjectProperty rdf:about="&cameraontology;isGuestInterfaceMemoryCardTypeOf">
            <rdfs:label xml:lang="en">is guest interface memory card type of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;guest interface memory card type&apos;.</rdfs:comment>
4940        <rdfs:domain rdf:resource="&cameraontology;MemoryCardType"/>
            <owl:inverseOf rdf:resource="&cameraontology;guestInterfaceMemoryCardType"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
            <rdfs:range>
                <owl:Class>
4945                <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&cameraontology;MemoryCardAdapterGeneric"/>
                        <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    </owl:unionOf>
                </owl:Class>
4950        </rdfs:range>
        </owl:ObjectProperty>



4955    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isHostInterfaceMemoryCardTypeOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isHostInterfaceMemoryCardTypeOf">
            <rdfs:label xml:lang="en">is host interface memory card type of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
4960        <rdfs:comment xml:lang="en">The inverse of &apos;host interface memory card type&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&cameraontology;MemoryCardType"/>
            <owl:inverseOf rdf:resource="&cameraontology;hostInterfaceMemoryCardType"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
            <rdfs:range>
4965            <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&cameraontology;MemoryCardAdapterGeneric"/>
                        <rdf:Description rdf:about="&cameraontology;MemoryCardGeneric"/>
```

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            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isImageBurstRateOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isImageBurstRateOf">
    <rdfs:label xml:lang="en">is image burst rate of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;image burst rate&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <owl:inverseOf rdf:resource="&cameraontology;imageBurstRate"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectFilterAccessoryInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectFilterAccessoryInterfaceOf">
    <rdfs:domain rdf:resource="&cameraontology;FilterAdapterGeneric"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectFilterLensInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectFilterLensInterfaceOf">
    <rdfs:range rdf:resource="&cameraontology;FilterAdapterGeneric"/>
    <rdfs:domain rdf:resource="&eco;C_AKN892002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectFlashAccessoryInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectFlashAccessoryInterfaceOf">
    <rdfs:domain rdf:resource="&cameraontology;ShoeAdapterGeneric"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectFlashCameraInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectFlashCameraInterfaceOf">
    <rdfs:range rdf:resource="&cameraontology;ShoeAdapterGeneric"/>
    <rdfs:domain rdf:resource="&eco;C_AKN888002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectLensAccessoryInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectLensAccessoryInterfaceOf">
    <rdfs:domain rdf:resource="&cameraontology;MountAdapterGeneric"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIndirectLensCameraInterfaceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isIndirectLensCameraInterfaceOf">
    <rdfs:range rdf:resource="&cameraontology;MountAdapterGeneric"/>
    <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
</owl:ObjectProperty>
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5050
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isInfopageOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isInfopageOf">
            <rdfs:label xml:lang="en">is infopage of (0..1)</rdfs:label>
5055        <rdfs:comment xml:lang="en">A webpage can be the infopage of a content file.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
            <owl:inverseOf rdf:resource="&cameraontology;infopage"/>
            <rdfs:domain rdf:resource="&foaf;Document"/>
5060        <rdfs:subPropertyOf rdf:resource="&foaf;topic"/>
        </owl:ObjectProperty>



5065    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIntelligentAutoRecognitionSceneOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isIntelligentAutoRecognitionSceneOf">
            <rdfs:label xml:lang="en">is intelligent auto recognition scene of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
5070        <rdfs:comment xml:lang="en">The inverse of &apos;intelligent auto recognition scene&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
            <owl:inverseOf rdf:resource="&cameraontology;intelligentAutoRecognitionScene"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
            <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
5075    </owl:ObjectProperty>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isInteriorDepthOf -->
5080
        <owl:ObjectProperty rdf:about="&cameraontology;isInteriorDepthOf">
            <rdfs:label xml:lang="en">is interior depth of (0..*)</rdfs:label>
            <rdfs:comment xml:lang="en">The inverse of &apos;interior depth&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
5085        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
            <owl:inverseOf rdf:resource="&cameraontology;interiorDepth"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
            <rdfs:range rdf:resource="&eco;C_AKN894002-gen"/>
        </owl:ObjectProperty>
5090


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isInteriorHeightOf -->

5095    <owl:ObjectProperty rdf:about="&cameraontology;isInteriorHeightOf">
            <rdfs:label xml:lang="en">is interior height of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;interior height&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
5100        <owl:inverseOf rdf:resource="&cameraontology;interiorHeight"/>
            <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
            <rdfs:range rdf:resource="&eco;C_AKN894002-gen"/>
        </owl:ObjectProperty>

5105

        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isInteriorWidthOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isInteriorWidthOf">
5110        <rdfs:label xml:lang="en">is interior width of (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;interior width&apos;.</rdfs:comment>
            <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
            <owl:inverseOf rdf:resource="&cameraontology;interiorWidth"/>
5115        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
            <rdfs:range rdf:resource="&eco;C_AKN894002-gen"/>
        </owl:ObjectProperty>


5120
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightness4kOf -->

        <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightness4kOf">
            <rdfs:label xml:lang="en">is lcd power consumption normal brightness 4k of (0..*)</rdfs:label>
5125        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness 4k&apos;.</rdfs:comment>
```

```
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightness4k"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessHdHddOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessHdHddOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness hd (hdd) of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness hd (hdd)&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessHdHdd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessHdMsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessHdMsOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness hd (ms) of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness hd (ms)&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessHdMs"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessHdOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessHdOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness hd of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness hd&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessHd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessMp4Of -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessMp4Of">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness mp4 of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness mp4&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessMp4"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightness"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessSdHddOf -->
```

```
    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessSdHddOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness sd (hdd) of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness sd (hdd)&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessSdHdd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessSdMsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessSdMsOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness sd (ms) of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness sd (ms)&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessSdMs"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLcdPowerConsumptionNormalBrightnessSdOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLcdPowerConsumptionNormalBrightnessSdOf">
        <rdfs:label xml:lang="en">is lcd power consumption normal brightness sd of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lcd power consumption normal brightness sd&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessSd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensApertureBladesOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensApertureBladesOf">
        <rdfs:label xml:lang="en">is lens aperture blades of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens aperture blades&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensApertureBlades"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensApertureTeleOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensApertureTeleOf">
        <rdfs:label xml:lang="en">is lens aperture tele of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens aperture tele&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensApertureTele"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
```

```
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensApertureWideOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensApertureWideOf">
        <rdfs:label xml:lang="en">is lens aperture wide of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens aperture wide&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensApertureWide"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensCorrectionOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensCorrectionOf">
        <rdfs:label xml:lang="en">is lens correction of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens correction&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensCorrection"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensDiameterOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensDiameterOf">
        <rdfs:label xml:lang="en">is lens diameter of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens diameter&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensDiameter"/>
        <rdfs:range rdf:resource="&eco;C_AKN891002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensElementsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensElementsOf">
        <rdfs:label xml:lang="en">is lens elements of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens elements&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensElements"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>
```

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5365
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensFocusOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensFocusOf">
        <rdfs:label xml:lang="en">is lens focus of (0..*)</rdfs:label>
5370    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens focus&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;LensFocus"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensFocus"/>
5375    <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
5380            </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>

5385

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensGroupsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensGroupsOf">
5390    <rdfs:label xml:lang="en">is lens groups of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens groups&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
5395    <owl:inverseOf rdf:resource="&cameraontology;lensGroups"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
5400                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>
5405

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensInterfaceLensThreadGenderOf -->

5410    <owl:ObjectProperty rdf:about="&cameraontology;isLensInterfaceLensThreadGenderOf">
        <rdfs:label xml:lang="en">is lens interface lens thread gender of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens interface lens thread gender&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;Gender"/>
5415    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensInterfaceLensThreadGender"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
5420                <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&cameraontology;LensCapGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN892002-gen"/>
                </owl:unionOf>
            </owl:Class>
5425    </rdfs:range>
    </owl:ObjectProperty>



5430    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensInterfaceLensThreadOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isLensInterfaceLensThreadOf">
        <rdfs:label xml:lang="en">is lens interface lens thread of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;lens interface lens thread&apos;.</rdfs:comment>
5435    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;lensInterfaceLensThread"/>
        <rdfs:range>
5440        <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
```

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                <rdf:Description rdf:about="&cameraontology;LensCapGeneric"/>
                <rdf:Description rdf:about="&eco;C_AKN892002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensLengthOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isLensLengthOf">
    <rdfs:label xml:lang="en">is lens length of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;lens length&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;lensLength"/>
    <rdfs:range rdf:resource="&eco;C_AKN891002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensMeasureOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isLensMeasureOf">
    <rdfs:label xml:lang="en">is lens measure of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;lens measure&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&cameraontology;LensMeasure"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;lensMeasure"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensTypeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isLensTypeOf">
    <rdfs:label xml:lang="en">is lens type of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;lens type&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&cameraontology;LensType"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;lensType"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensZoomOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isLensZoomOf">
    <rdfs:label xml:lang="en">is lens zoom of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;lens zoom&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&cameraontology;LensZoom"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;lensZoom"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
```

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            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMaximumBurstLengthOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMaximumBurstLengthOf">
    <rdfs:label xml:lang="en">is maximum burst length of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;maximum burst length&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;maximumBurstLength"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMaximumMagnificationOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMaximumMagnificationOf">
    <rdfs:label xml:lang="en">is maximum magnification of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;maximum magnification&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;maximumMagnification"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMaximumSupportedWeightOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMaximumSupportedWeightOf">
    <rdfs:label xml:lang="en">is maximum supported weight of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;maximum supported weight&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;maximumSupportedWeight"/>
    <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMediaHeightOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMediaHeightOf">
    <rdfs:label xml:lang="en">is media height of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">A Quantitative Value is the height of a Media Object.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:range rdf:resource="&s;MediaObject"/>
    <owl:inverseOf rdf:resource="&cameraontology;mediaHeight"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMediaWidthOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMediaWidthOf">
    <rdfs:label xml:lang="en">is media width of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">A Quantitative Value is the width of a Media Object.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:range rdf:resource="&s;MediaObject"/>
    <owl:inverseOf rdf:resource="&cameraontology;mediaWidth"/>
</owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMicrophoneOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMicrophoneOf">
    <rdfs:label xml:lang="en">is microphone of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;microphone&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&cameraontology;Microphone"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;microphone"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMinimumFocusDistanceOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMinimumFocusDistanceOf">
    <rdfs:label xml:lang="en">is minimum focus distance of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;minimum focus distance&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;minimumFocusDistance"/>
    <rdfs:range>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMovieShutterSpeedOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isMovieShutterSpeedOf">
    <rdfs:label xml:lang="en">is movie shutter speed of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;movie shutter speed&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;movieShutterSpeed"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isNtscAutoModeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isNtscAutoModeOf">
    <rdfs:label xml:lang="en">is ntsc auto mode of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;ntsc auto mode&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;ntscAutoMode"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isNtscAutoSlowShuterModeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isNtscAutoSlowShuterModeOf">
    <rdfs:label xml:lang="en">is ntsc auto slow shutter mode of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;ntsc auto slow shutter mode&apos;.</rdfs:comment>
```

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        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;ntscAutoSlowShutterMode"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOfContentSubType -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOfContentSubType">
        <rdfs:label xml:lang="en">is of content subtype (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a content file is of content subtype.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&cameraontology;ContentSubType"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOfProductSeries -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOfProductSeries">
        <rdfs:label xml:lang="en">is of product series (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product model can belong to some product series.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <rdfs:range rdf:resource="&cameraontology;ProductSeries"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOfSReview -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOfSReview">
        <rdfs:label xml:lang="en">is of s review (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Rating can be given in a Review.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;Rating"/>
        <rdfs:range rdf:resource="&s;Review"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgImageHeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgImageHeightOf">
        <rdfs:label xml:lang="en">is og image height of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Quantitative Value representing the Image height belongs to an Image.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&og;Image"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isMediaHeightOf"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgImageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgImageOf">
        <rdfs:label xml:lang="en">is og image of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Image depicts a Thing.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSImageOf"/>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Image"/>
        <owl:equivalentProperty rdf:resource="&foaf;depicts"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgImageWidthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgImageWidthOf">
        <rdfs:label xml:lang="en">is og image width of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Quantitative Value representing the Image width belongs to an Image.</rdfs:comment>
        <rdfs:range rdf:resource="&og;Image"/>
        <owl:inverseOf rdf:resource="&og;image:width"/>
```

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        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isMediaWidthOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgVideoHeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgVideoHeightOf">
        <rdfs:label xml:lang="en">is of video height of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Quantitative Value representing the Video height belongs to an Video.</rdfs:comment>
        <rdfs:range rdf:resource="&og;Video"/>
        <owl:inverseOf rdf:resource="&og;video:height"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isMediaHeightOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgVideoOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgVideoOf">
        <rdfs:label xml:lang="en">is og video of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Video Object belongs to either a Creative Work or a Product.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;VideoObject"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSVideoOf"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOgVideoWidthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOgVideoWidthOf">
        <rdfs:label xml:lang="en">is og video width of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Quantitative Value representing the Video width belongs to an Video.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&og;Video"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isMediaWidthOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOperatingTemperatureOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOperatingTemperatureOf">
        <rdfs:label xml:lang="en">is operating temperature of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;operating temperature&apos;.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;operatingTemperature"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isOpticalZoomOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isOpticalZoomOf">
        <rdfs:label xml:lang="en">is optical zoom of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;optical zoom&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;opticalZoom"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
```

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                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:range>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPalAutoModeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isPalAutoModeOf">
    <rdfs:label xml:lang="en">is pal auto mode of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;pal auto mode&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;palAutoMode"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPalAutoSlowShutterModeOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isPalAutoSlowShutterModeOf">
    <rdfs:label xml:lang="en">is pal auto slow shutter mode of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;pal auto slow shutter mode&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;palAutoSlowShutterMode"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPanHandleLengthOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isPanHandleLengthOf">
    <rdfs:label xml:lang="en">is pan handle length of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;pan handle length&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;panHandleLength"/>
    <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPanningAngleOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isPanningAngleOf">
    <rdfs:label xml:lang="en">is panning angle of (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The inverse of &apos;panning angle&apos;.</rdfs:comment>
    <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;panningAngle"/>
    <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPhotoCreativitySettingOf -->

<owl:ObjectProperty rdf:about="&cameraontology;isPhotoCreativitySettingOf">
    <rdfs:label xml:lang="en">is photo creativity settting of (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The inverse of &apos;photo creativity setting&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&cameraontology;PhotoCreativitySetting"/>
    <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
    <owl:inverseOf rdf:resource="&cameraontology;photoCreativitySetting"/>
    <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPictureEffectOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isPictureEffectOf">
        <rdfs:label xml:lang="en">is picture effect of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;picture effect&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;pictureEffect"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPortOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isPortOf">
        <rdfs:label xml:lang="en">is port of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;port&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;PortType"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;port"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isPowerRequirementOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isPowerRequirementOf">
        <rdfs:label xml:lang="en">is power requirement of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;power requirement&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;powerRequirement"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProductCategoryOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProductCategoryOf">
        <rdfs:label xml:lang="en">is product category of (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product category belongs to some product type.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ProductCategory"/>
        <rdfs:range rdf:resource="&cameraontology;ProductType"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasProductCategory"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProductSeriesOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProductSeriesOf">
        <rdfs:label xml:lang="en">is product series of (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product series belongs to some product subcategories.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ProductSeries"/>
        <rdfs:range rdf:resource="&cameraontology;ProductSubCategory"/>
        <owl:inverseOf rdf:resource="&cameraontology;hasProductSeries"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProductSubCategoryOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProductSubCategoryOf">
        <rdfs:label xml:lang="en">is product subcategory of (1..*)</rdfs:label>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">a product subcategory belongs to some product category.</rdfs:comment>
        <rdfs:range rdf:resource="&cameraontology;ProductCategory"/>
        <rdfs:domain rdf:resource="&cameraontology;ProductSubCategory"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProductWeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProductWeightOf">
        <rdfs:label xml:lang="en">is product weight of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A weight belongs to a Product or Service.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <owl:inverseOf rdf:resource="&product;weight"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;isSWeightOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionBrightnessOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionBrightnessOf">
        <rdfs:label xml:lang="en">is projection brightness of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &amp;apos;projection brightness&amp;apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionBrightness"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionColorPrecisionOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionColorPrecisionOf">
        <rdfs:label xml:lang="en">is projection color precision of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &amp;apos;projection color precision&amp;apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionColorPrecision"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionContinuousTimeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionContinuousTimeOf">
        <rdfs:label xml:lang="en">is projection continuous time of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &amp;apos;projection continuous time&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionContinuousTime"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionContrastRatioOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionContrastRatioOf">
        <rdfs:label xml:lang="en">is projection contrast ratio of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &amp;apos;projection contrast ratio&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionContrastRatio"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionImageSizeRangeOf -->
```

```
    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionImageSizeRangeOf">
        <rdfs:label xml:lang="en">is projection image size range of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;projection image size range&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionImageSizeRange"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isProjectionThrowDistanceRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isProjectionThrowDistanceRangeOf">
        <rdfs:label xml:lang="en">is projection throw distance range of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;projection throw distance range&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;projectionThrowDistanceRange"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSAggregateRatingOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSAggregateRatingOf">
        <rdfs:label xml:lang="en">is s aggregate rating of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">An Aggregate Rating belongs to either a Creative Work, an Offer, an Organization, or a
↪   Product.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;AggregateRating"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSDepthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSDepthOf">
        <rdfs:label xml:lang="en">is s depth of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A depth belongs to a Product.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&s;depth"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSEligibleQuantityOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSEligibleQuantityOf">
        <rdfs:label xml:lang="en">is s eligible quantity of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A quantitative value is an eligible quantity of an offer or a price
↪   specification.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&s;eligibleQuantity"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;PriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
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    </owl:ObjectProperty>


6155
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSHeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSHeightOf">
        <rdfs:label xml:lang="en">is s height of (0..*)</rdfs:label>
6160    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A height belongs to a Media Object or Product.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&s;height"/>
6165    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSImageOf -->
6170
    <owl:ObjectProperty rdf:about="&cameraontology;isSImageOf">
        <rdfs:label xml:lang="en">is s image of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">An image object is the image of a thing.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
6175    <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Image"/>
        <owl:equivalentProperty rdf:resource="&foaf;depicts"/>
    </owl:ObjectProperty>

6180

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSInstrumentOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSInstrumentOf">
6185    <rdfs:label xml:lang="en">is s instrument of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The action that the agent performed with the object. e.g. John wrote a book with *a
    ↪   pen*.</rdfs:comment>
        <rdfs:range rdf:resource="&s;Action"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
6190    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSItemOfferedIn -->
6195
    <owl:ObjectProperty rdf:about="&cameraontology;isSItemOfferedIn">
        <rdfs:label xml:lang="en">is s item offered in (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product is Offered in an Offer.</rdfs:comment>
6200    <rdfs:range rdf:resource="&gr;Offering"/>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:inverseOf rdf:resource="&s;itemOffered"/>
    </owl:ObjectProperty>

6205

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSItemReviewedOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSItemReviewedOf">
6210    <rdfs:label xml:lang="en">is s item reviewed of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Creative Work, an Offer, an Organization, or a Product is the item that is being reviewed
    ↪   by an Aggregate Rating or a Review.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain>
            <owl:Class>
6215            <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
6220            </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
        <rdfs:range>
            <owl:Class>
6225            <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;AggregateRating"/>
                    <rdf:Description rdf:about="&s;Review"/>
                </owl:unionOf>
```

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            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSLanguageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSLanguageOf">
        <rdfs:label xml:lang="en">is s language of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Language of the Write Action.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;Language"/>
        <rdfs:range rdf:resource="&s;WriteAction"/>
        <owl:inverseOf rdf:resource="&s;language"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isSInstrumentOf"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSModelOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSModelOf">
        <rdfs:label xml:lang="en">is s model of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The model of a Product.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:inverseOf rdf:resource="&s;model"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Individual"/>
                    <rdf:Description rdf:about="&gr;SomeItems"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSOfferedBy -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSOfferedBy">
        <rdfs:label xml:lang="en">is s offered by (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">An Offer is made by an Organization.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;BusinessEntity"/>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <owl:inverseOf rdf:resource="&s;makesOffer"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSOwnedBy -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSOwnedBy">
        <rdfs:label xml:lang="en">is s owned by (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Product is owned by an Organization or Person.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;BusinessEntity"/>
        <rdfs:domain rdf:resource="&gr;Individual"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSPriceSpecificationOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSPriceSpecificationOf">
        <rdfs:label xml:lang="en">is s price specification of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Price Specification of an Offer.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;Offering"/>
        <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSReviewOf -->
```

```
    <owl:ObjectProperty rdf:about="&cameraontology;isSReviewOf">
        <rdfs:label xml:lang="en">is s review of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Review belongs to either a Creative Work, an Offer, an Organization, or a
↪   Product.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;Review"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSThumbnailOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSThumbnailOf">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is s thumbnail of (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">An image object can be the thumbnail of another image object.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;ImageObject"/>
        <owl:inverseOf rdf:resource="&s;thumbnail"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;ImageObject"/>
                    <rdf:Description rdf:about="&s;VideoObject"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSValueReferenceOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSValueReferenceOf">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">is s value reference of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Value Reference is a reference of either an Enumeration or Structured Value.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QualitativeValue"/>
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSVideoOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSVideoOf">
        <rdfs:label xml:lang="en">is s video of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Video belongs to a Creative Work.</rdfs:comment>
        <rdfs:seeAlso xml:lang="en">Warning in the comment on s:image</rdfs:seeAlso>
        <rdfs:domain rdf:resource="&s;VideoObject"/>
        <rdfs:range>
```

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            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;CreativeWork"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSWeightOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSWeightOf">
        <rdfs:label xml:lang="en">is s weight of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A weight belongs to some product.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&s;weight"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSWidthOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSWidthOf">
        <rdfs:label xml:lang="en">is s width of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A width belongs to a media object or product.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <owl:inverseOf rdf:resource="&s;width"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSceneSelectionOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSceneSelectionOf">
        <rdfs:label xml:lang="en">is scene selection of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;scene selection&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;sceneSelection"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSensorFormatOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSensorFormatOf">
        <rdfs:label xml:lang="en">is sensor format of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;sensor format&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSensorMatchOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSensorMatchOf">
        <rdfs:label xml:lang="en">is sensor match of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;sensor match&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;sensorMatch"/>
        <rdfs:range rdf:resource="&eco;C_AKN891002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSmileShutterOf -->
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    <owl:ObjectProperty rdf:about="&cameraontology;isSmileShutterOf">
        <rdfs:label xml:lang="en">is smile shutter of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;smile shutter&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;SmileShutter"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;smileShutter"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSpeakerOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSpeakerOf">
        <rdfs:label xml:lang="en">is speaker of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;speaker&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;Speaker"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;speaker"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isStagesOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isStagesOf">
        <rdfs:label xml:lang="en">is stages of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;stages&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;stages"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSteadyShotOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSteadyShotOf">
        <rdfs:label xml:lang="en">is steadyshot of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;steadyshot&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;SteadyShot"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;steadyShot"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isStorageTemperatureOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isStorageTemperatureOf">
        <rdfs:label xml:lang="en">is storage temperature of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;storage temperature&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;storageTemperature"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isSwitchOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isSwitchOf">
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        <rdfs:label xml:lang="en">is switch of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;switch&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;Switch"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;switch"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isTiltingAngleDownOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isTiltingAngleDownOf">
        <rdfs:label xml:lang="en">is tilting angle down of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;tilting angle down&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;tiltingAngleDown"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isTiltingAngleUpOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isTiltingAngleUpOf">
        <rdfs:label xml:lang="en">is tilting angle up of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;tilting angle up&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;tiltingAngleUp"/>
        <rdfs:range rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isTripodOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isTripodOf">
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isUsbCurrentOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isUsbCurrentOf">
        <rdfs:label xml:lang="en">is usb current of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;usb current&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;usbCurrent"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isUsbVoltageOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isUsbVoltageOf">
        <rdfs:label xml:lang="en">is usb voltage of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;usb voltage&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;usbVoltage"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderDiopterRangeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderDiopterRangeOf">
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        <rdfs:label xml:lang="en">is viewfinder diopter range of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder diopter range&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderDiopterRange"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderEffectivePixelsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderEffectivePixelsOf">
        <rdfs:label xml:lang="en">is viewfinder effective pixels of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder effective pixels&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderEffectivePixels"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderEyePointFromEyePieceOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderEyePointFromEyePieceOf">
        <rdfs:label xml:lang="en">is viewfinder eyepoint from eyepiece of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder eyepoint from eyepiece&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderEyePointFromEyePiece"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderEyePointFromFrameOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderEyePointFromFrameOf">
        <rdfs:label xml:lang="en">is viewfinder eyepoint from frame of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder eyepoint from frame&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderEyePointFromFrame"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderFieldOfViewOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderFieldOfViewOf">
        <rdfs:label xml:lang="en">is viewfinder field of view of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder field of view&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderFieldOfView"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderMagnificationOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderMagnificationOf">
        <rdfs:label xml:lang="en">is viewfinder magnification of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder magnification&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderMagnification"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightness4kOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightness4kOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness 4k of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness 4k&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightness4k"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessHdHddOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessHdHddOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness hd (hdd) of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness hd
    ↪   (hdd)&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHdHdd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessHdMsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessHdMsOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness hd (ms) of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness hd
    ↪   (ms)&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHdMs"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessHdOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessHdOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness hd of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness hd&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessMp4Of -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessMp4Of">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness mp4 of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness mp4&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessMp4"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

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        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightness"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessSdHddOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessSdHddOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness sd (hdd) of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness sd
↪   (hdd)&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSdHdd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessSdMsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessSdMsOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness sd (ms) of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness sd
↪   (ms)&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSdMs"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderPowerConsumptionNormalBrightnessSdOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderPowerConsumptionNormalBrightnessSdOf">
        <rdfs:label xml:lang="en">is viewfinder power consumption normal brightness sd of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder power consumpton normal brightness sd&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSd"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderSizeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderSizeOf">
        <rdfs:label xml:lang="en">is viewfinder size of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder size&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderSize"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isViewFinderTotalPixelsOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isViewFinderTotalPixelsOf">
        <rdfs:label xml:lang="en">is viewfinder total pixels of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The inverse of &apos;viewfinder total pixels&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;viewFinderTotalPixels"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isWeightBodyOnlyOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isWeightBodyOnlyOf">
        <rdfs:label xml:lang="en">is weight body only of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;weight body only&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQuantitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;weightBodyOnly"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isWhiteBalanceModeOf -->

    <owl:ObjectProperty rdf:about="&cameraontology;isWhiteBalanceModeOf">
        <rdfs:label xml:lang="en">is white balance mode of (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The inverse of &apos;white balance mode&apos;.</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:subPropertyOf rdf:resource="&cameraontology;isGrQualitativeProductOrServicePropertyOf"/>
        <owl:inverseOf rdf:resource="&cameraontology;whiteBalanceMode"/>
        <rdfs:range rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightness -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightness">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting.

Power consumption is expressed in Watt (W).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightness4k -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightness4k">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness 4k (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in 4k mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessHd -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessHd">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness hd (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in HD mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessHdHdd -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessHdHdd">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness hd (hdd) (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in HD mode (HDD).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
```

```
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessHdMs -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessHdMs">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness hd (ms) (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in HD mode (MS).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessMp4 -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessMp4">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness mp4 (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in MP4 mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessSd -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessSd">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness sd (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in SD mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessSdHdd -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessSdHdd">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness sd (hdd) (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in SD mode (HDD).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lcdPowerConsumptionNormalBrightnessSdMs -->

    <owl:ObjectProperty rdf:about="&cameraontology;lcdPowerConsumptionNormalBrightnessSdMs">
        <rdfs:label xml:lang="en">lcd power consumption normal brightness sd (ms) (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">LCD Power Comsumption under Normal Brightness setting in SD mode (MS).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensApertureBlades -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensApertureBlades">
        <rdfs:label xml:lang="en">lens aperture blades (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The number of aperture blades of a lens.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
```

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            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensApertureTele -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensApertureTele">
        <rdfs:label xml:lang="en">lens aperture tele (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The lens aperture (tele zoom).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensApertureWide -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensApertureWide">
        <rdfs:label xml:lang="en">lens aperture wide (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The lens aperture (wide zoom).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensCorrection -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensCorrection">
        <rdfs:label xml:lang="en">lens correction (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera or lens can support several different kinds of lens corrections.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensDiameter -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensDiameter">
        <rdfs:label xml:lang="en">lens diameter (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A lens has a diameter.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
```

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        <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensElements -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensElements">
        <rdfs:label xml:lang="en">lens elements (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The number of lens parts.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensFocus -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensFocus">
        <rdfs:label xml:lang="en">lens focus (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera or lens can support several different kinds of lens focus modes.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;LensFocus"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensGroups -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensGroups">
        <rdfs:label xml:lang="en">lens groups (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The number of lens groups, i.e. the distinct parts (groups) of a lens.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensInterfaceLensThread -->

    <owl:ObjectProperty rdf:about="&cameraontology;lensInterfaceLensThread">
        <rdfs:label xml:lang="en">lens interface lens thread (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The lens thread on the side of the accessory.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                    <rdf:Description rdf:about="&cameraontology;LensCapGeneric"/>
                    <rdf:Description rdf:about="&eco;C_AKN892002-gen"/>
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            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensInterfaceLensThreadGender -->

<owl:ObjectProperty rdf:about="&cameraontology;lensInterfaceLensThreadGender">
    <rdfs:label xml:lang="en">lens interface lens thread gender (0..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The lens thread gender on the side of the accessory. If not specified, Male can be
↪   assumed.</rdfs:comment>
    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
    <rdfs:range rdf:resource="&cameraontology;Gender"/>
    <rdfs:domain>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&cameraontology;FilterAdapterGeneric"/>
                <rdf:Description rdf:about="&cameraontology;LensCapGeneric"/>
                <rdf:Description rdf:about="&eco;C_AKN892002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensLength -->

<owl:ObjectProperty rdf:about="&cameraontology;lensLength">
    <rdfs:label xml:lang="en">lens length (1..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">A Lens has a Length.</rdfs:comment>
    <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensMeasure -->

<owl:ObjectProperty rdf:about="&cameraontology;lensMeasure">
    <rdfs:label xml:lang="en">lens measure (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">A camera or lens can support several different kinds of lens measure modes.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
    <rdfs:range rdf:resource="&cameraontology;LensMeasure"/>
    <rdfs:domain>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensType -->

<owl:ObjectProperty rdf:about="&cameraontology;lensType">
    <rdfs:label xml:lang="en">lens type (0..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The lens type of a Camera or Lens.</rdfs:comment>
    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
    <rdfs:range rdf:resource="&cameraontology;LensType"/>
    <rdfs:domain>
        <owl:Class>
            <owl:unionOf rdf:parseType="Collection">
                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>
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7250
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensZoom -->

7255    <owl:ObjectProperty rdf:about="&cameraontology;lensZoom">
            <rdfs:label xml:lang="en">lens zoom (0..*)</rdfs:label>
            <rdfs:comment xml:lang="en">A camera or lens can support several different kinds of lens zoom modes.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
7260        <rdfs:range rdf:resource="&cameraontology;LensZoom"/>
            <rdfs:domain>
                <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
7265                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                    </owl:unionOf>
                </owl:Class>
            </rdfs:domain>
        </owl:ObjectProperty>
7270


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#maximumBurstLength -->

7275    <owl:ObjectProperty rdf:about="&cameraontology;maximumBurstLength">
            <rdfs:label xml:lang="en">maximum burst length (0..1)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The maximum burst length of a camera. I.e. the maximum number of images per
  ↪    burst.</rdfs:comment>
            <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
7280        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        </owl:ObjectProperty>


7285
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#maximumMagnification -->

        <owl:ObjectProperty rdf:about="&cameraontology;maximumMagnification">
            <rdfs:label xml:lang="en">maximum magnification (0..1)</rdfs:label>
7290        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The maximum magnification of a lens.</rdfs:comment>
            <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
            <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain>
7295            <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                        <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                    </owl:unionOf>
7300            </owl:Class>
            </rdfs:domain>
        </owl:ObjectProperty>


7305
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#maximumSupportedWeight -->

        <owl:ObjectProperty rdf:about="&cameraontology;maximumSupportedWeight">
            <rdfs:label xml:lang="en">maximum supported weight (1..1)</rdfs:label>
7310        <rdfs:comment xml:lang="en">A Tripod has a maximum weight it can support.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
            <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
7315    </owl:ObjectProperty>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#mediaHeight -->
7320
        <owl:ObjectProperty rdf:about="&cameraontology;mediaHeight">
            <rdfs:label xml:lang="en">media height (0..1)</rdfs:label>
            <rdfs:comment xml:lang="en">A Media Object can have a certain height.

7325    Warning: In Schema.Org this object property is a subpart of the object property height. Because we want to match this ontology a
  ↪    close a possible to GoodRelations, we decided to split Schema.Org&apos;s definition of this property.</rdfs:comment>
            <rdfs:seeAlso xml:lang="en">The definition of http://schema.org/height in this ontology.</rdfs:seeAlso>
```

```
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:domain rdf:resource="&s;MediaObject"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#mediaWidth -->

    <owl:ObjectProperty rdf:about="&cameraontology;mediaWidth">
        <rdfs:label xml:lang="en">media width (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A Media Object can have a certain width.

Warning: In Schema.Org this object property is a subpart of the object property weight. Because we want to match this ontology a
  ↪  close a possible to GoodRelations, we decided to split Schema.Org&apos;s definition of this property.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:seeAlso xml:lang="en">The definition of http://schema.org/width in this ontology.</rdfs:seeAlso>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:domain rdf:resource="&s;MediaObject"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#microphone -->

    <owl:ObjectProperty rdf:about="&cameraontology;microphone">
        <rdfs:label xml:lang="en">microphone (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The microphone mode of a microphone or camera.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Microphone"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#minimumFocusDistance -->

    <owl:ObjectProperty rdf:about="&cameraontology;minimumFocusDistance">
        <rdfs:label xml:lang="en">minimum focus distance (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The minimum focus distance of a camera.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#movieShutterSpeed -->

    <owl:ObjectProperty rdf:about="&cameraontology;movieShutterSpeed">
        <rdfs:label xml:lang="en">movie shuter speed (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The movie shutter speed of a camera.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ntscAutoMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;ntscAutoMode">
```

```
        <rdfs:label xml:lang="en">ntsc auto mode (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The automatisch shutter speed mode when filming in NTSC.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ntscAutoSlowShutterMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;ntscAutoSlowShutterMode">
        <rdfs:label xml:lang="en">ntsc auto slow shutter mode (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The automatisch slow shutter speed mode when filming in NTSC.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#objectIsGrIncludedIn -->

    <owl:ObjectProperty rdf:about="&cameraontology;objectIsGrIncludedIn">
        <rdfs:label xml:lang="en">object is gr included in (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Type and Quantity Node Object is Included In an Offering</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;Offering"/>
        <rdfs:domain rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;objectIsSIncludedIn"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#objectIsSIncludedIn -->

    <owl:ObjectProperty rdf:about="&cameraontology;objectIsSIncludedIn">
        <rdfs:label xml:lang="en">object is s included in (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Type And Quantity Node describes an Offer.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;Offering"/>
        <rdfs:domain rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:inverseOf rdf:resource="&s;includesObject"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#operatingTemperature -->

    <owl:ObjectProperty rdf:about="&cameraontology;operatingTemperature">
        <rdfs:label xml:lang="en">operating temperature (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The operating temperature (range) of a device.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#opticalZoom -->

    <owl:ObjectProperty rdf:about="&cameraontology;opticalZoom">
        <rdfs:label xml:lang="en">optical zoom (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The optical zoom factor.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>
```

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7485
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#palAutoMode -->

        <owl:ObjectProperty rdf:about="&cameraontology;palAutoMode">
7490        <rdfs:label xml:lang="en">pal auto mode (0..1)</rdfs:label>
            <rdfs:comment xml:lang="en">The automatisch shutter speed mode when filming in PAL.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
            <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
7495        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        </owl:ObjectProperty>



7500    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#palAutoSlowShutterMode -->

        <owl:ObjectProperty rdf:about="&cameraontology;palAutoSlowShutterMode">
            <rdfs:label xml:lang="en">pal auto slow shutter mode (0..1)</rdfs:label>
            <rdfs:comment xml:lang="en">The automatisch slow shutter speed mode when filming in PAL.</rdfs:comment>
7505        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
            <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        </owl:ObjectProperty>
7510



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#panHandleLength -->

7515    <owl:ObjectProperty rdf:about="&cameraontology;panHandleLength">
            <rdfs:label xml:lang="en">pan handle length (1..1)</rdfs:label>
            <rdfs:comment xml:lang="en">The length of the Pan Handle.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
7520        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
        </owl:ObjectProperty>



7525
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#panningAngle -->

        <owl:ObjectProperty rdf:about="&cameraontology;panningAngle">
            <rdfs:label xml:lang="en">panning angle (1..1)</rdfs:label>
7530        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The panning angle of a Tripod.</rdfs:comment>
            <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
            <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
            <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
7535    </owl:ObjectProperty>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#photoCreativitySetting -->
7540
        <owl:ObjectProperty rdf:about="&cameraontology;photoCreativitySetting">
            <rdfs:label xml:lang="en">photo creativity setting (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">Cameras can have different &apos;photo creativity setting&apos; settings.</rdfs:comment>
7545        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
            <rdfs:range rdf:resource="&cameraontology;PhotoCreativitySetting"/>
            <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        </owl:ObjectProperty>

7550



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#pictureEffect -->

        <owl:ObjectProperty rdf:about="&cameraontology;pictureEffect">
7555        <rdfs:label xml:lang="en">picture effect (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A camera can have different &apos;picture effect&apos; settings.</rdfs:comment>
            <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
            <rdfs:range rdf:resource="&cameraontology;PictureEffect"/>
7560        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        </owl:ObjectProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#port -->

    <owl:ObjectProperty rdf:about="&cameraontology;port">
        <rdfs:label xml:lang="en">port (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The port interfaces of a camera.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;PortType"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#powerRequirement -->

    <owl:ObjectProperty rdf:about="&cameraontology;powerRequirement">
        <rdfs:label xml:lang="en">power requirement (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An accessory like a Lens or Flash may require power from the battery of the camera. This
    ↪   requirement is expressed via this relation.
Power requirement is expressed in Watt (W).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#productBrands -->

    <owl:ObjectProperty rdf:about="&cameraontology;productBrands">
        <rdfs:label xml:lang="en">product brands (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A brands &apos;brands&apos; a Product or a service and &apos;brands&apos; a Business
    ↪   Entity.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;Brand"/>
        <owl:equivalentProperty rdf:resource="&cameraontology;sBrands"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionBrightness -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionBrightness">
        <rdfs:label xml:lang="en">projection brightness (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The max. Brightness of the projection of a (Video)Camera. Expressed in Lumen.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionColorPrecision -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionColorPrecision">
        <rdfs:label xml:lang="en">projection color precision (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The number of colors the projection can reproduce.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
```

```
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionContinuousTime -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionContinuousTime">
        <rdfs:label xml:lang="en">projection continuous time (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The max. continuous time a projection can last. Expressed in minutes.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionContrastRatio -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionContrastRatio">
        <rdfs:label xml:lang="en">projection contrast ratio (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The projection contrast ratio. Only the numerator is stored, as contrast ratios are
↪   expressed X:1.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionImageSizeRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionImageSizeRange">
        <rdfs:label xml:lang="en">projection image size range (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The min and max image size of a projection.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionThrowDistanceRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;projectionThrowDistanceRange">
        <rdfs:label xml:lang="en">projection throw distance range (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The min and max throw distance value.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#sBrands -->

    <owl:ObjectProperty rdf:about="&cameraontology;sBrands">
        <rdfs:label xml:lang="en">s brands (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A Brand brands an Organization.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;Brand"/>
        <rdfs:range>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:range>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#sManufactures -->
```

```
    <owl:ObjectProperty rdf:about="&cameraontology;sManufactures">
        <rdfs:label xml:lang="en">s manufactures (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Organization manufactures Products.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <rdfs:range rdf:resource="&gr;ProductOrService"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#sceneSelection -->

    <owl:ObjectProperty rdf:about="&cameraontology;sceneSelection">
        <rdfs:label xml:lang="en">scene selection (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have several &apos;scene selection&apos; settings.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#sensorFormat -->

    <owl:ObjectProperty rdf:about="&cameraontology;sensorFormat">
        <rdfs:label xml:lang="en">sensor format (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera has a fixed sensor format.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;SensorFormat"/>
        <owl:inverseOf rdf:resource="&cameraontology;isSensorFormatOf"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#sensorMatch -->

    <owl:ObjectProperty rdf:about="&cameraontology;sensorMatch">
        <rdfs:label xml:lang="en">sensor match (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A lens is designed with respect to a sensor format. However, lenses can
also be used with different sensor types; if one accepts certain
limitations such as format, quality, etc.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#smileShutter -->

    <owl:ObjectProperty rdf:about="&cameraontology;smileShutter">
        <rdfs:label xml:lang="en">smile shutter (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A camera can have several &apos;smile shutter&apos; settings.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;SmileShutter"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#speaker -->

    <owl:ObjectProperty rdf:about="&cameraontology;speaker">
        <rdfs:label xml:lang="en">speaker (0..2)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The speaker mode of a speaker or camera.

For stereo mode, either two seperate speakers are required or one integrated stereo speaker.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;Speaker"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
```

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                <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                <rdf:Description rdf:about="&eco;C_AKN887003-gen"/>
            </owl:unionOf>
        </owl:Class>
    </rdfs:domain>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#stages -->

<owl:ObjectProperty rdf:about="&cameraontology;stages">
    <rdfs:label xml:lang="en">stages (1..1)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The number of stages on which one can preset the tripod. E.g. 0 degree, 30 degree,
↪   etc.</rdfs:comment>
    <rdfs:range rdf:resource="&gr;QuantitativeValueInteger"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
    <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#steadyShot -->

<owl:ObjectProperty rdf:about="&cameraontology;steadyShot">
    <rdfs:label xml:lang="en">steadyshot (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">Steadyshot capability.</rdfs:comment>
    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
    <rdfs:range rdf:resource="&cameraontology;SteadyShot"/>
    <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#storageTemperature -->

<owl:ObjectProperty rdf:about="&cameraontology;storageTemperature">
    <rdfs:label xml:lang="en">storage temperature (0..1)</rdfs:label>
    <rdfs:comment xml:lang="en">The storage temperature (range) of a device.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:domain rdf:resource="&gr;ProductOrService"/>
    <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
    <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#subtypes -->

<owl:ObjectProperty rdf:about="&cameraontology;subtypes">
    <rdfs:label xml:lang="en">subtypes (0..*)</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">a content subtype describes a content file.</rdfs:comment>
    <rdfs:range rdf:resource="&cameraontology;ContentFile"/>
    <rdfs:domain rdf:resource="&cameraontology;ContentSubType"/>
    <owl:inverseOf rdf:resource="&cameraontology;isOfContentSubType"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#switch -->

<owl:ObjectProperty rdf:about="&cameraontology;switch">
    <rdfs:label xml:lang="en">switch (0..*)</rdfs:label>
    <rdfs:comment xml:lang="en">The switches on a device.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
    <rdfs:range rdf:resource="&cameraontology;Switch"/>
    <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
</owl:ObjectProperty>



<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#tiltingAngleDown -->

<owl:ObjectProperty rdf:about="&cameraontology;tiltingAngleDown">
    <rdfs:label xml:lang="en">tilting angle down (1..1)</rdfs:label>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The tilting angle down.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#tiltingAngleUp -->

    <owl:ObjectProperty rdf:about="&cameraontology;tiltingAngleUp">
        <rdfs:label xml:lang="en">tilting angle up (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The up tilting angle.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#usbCurrent -->

    <owl:ObjectProperty rdf:about="&cameraontology;usbCurrent">
        <rdfs:label xml:lang="en">usb current (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The current delivered by the USB interface. Expressed in mA (milli ampere).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#usbVoltage -->

    <owl:ObjectProperty rdf:about="&cameraontology;usbVoltage">
        <rdfs:label xml:lang="en">usb voltage (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The voltage delivered by the USB interface. Expressed in Voltage (V).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderDiopterRange -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderDiopterRange">
        <rdfs:label xml:lang="en">viewfinder diopter range (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The diopter range of the viewfinder.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderEffectivePixels -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderEffectivePixels">
        <rdfs:label xml:lang="en">viewfinder effective pixels (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The number of effective pixels on the viewfinder.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderEyePointFromEyePiece -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderEyePointFromEyePiece">
        <rdfs:label xml:lang="en">viewfinder eyepoint from eyepiece (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">The eyepoint distance from the eyepiece.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderEyePointFromFrame -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderEyePointFromFrame">
        <rdfs:label xml:lang="en">viewfinder eyepoint from frame (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The eyepoint distance from the frame.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderFieldOfView -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderFieldOfView">
        <rdfs:label xml:lang="en">viewfinder field of view (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The FoV number belonging to a viewfinder.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderMagnification -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderMagnification">
        <rdfs:label xml:lang="en">viewfinder magnification (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The magnification is 35mm equivalent.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightness -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightness">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting.

Power consumption is expressed in Watt (W).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightness4k -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightness4k">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness 4k (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in 4k mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessHd -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHd">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness hd (0..1)</rdfs:label>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in HD mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessHdHdd -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHdHdd">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness hd (hdd) (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in HD mode (HDD).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessHdMs -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessHdMs">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness hd (ms) (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in HD mode (MS).</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessMp4 -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessMp4">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness mp4 (0..1)</rdfs:label>
        <rdfs:comment>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:comment>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in MP4 mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessSd -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSd">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness sd (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in SD mode.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessSdHdd -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSdHdd">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness sd (hdd) (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in SD mode (HDD).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderPowerConsumptionNormalBrightnessSdMs -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderPowerConsumptionNormalBrightnessSdMs">
        <rdfs:label xml:lang="en">viewfinder power consumption normal brightness sd (ms) (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">ViewFinder Power Comsumption under Normal Brightness setting in SD mode (MS).</rdfs:comment>
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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderSize -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderSize">
        <rdfs:label xml:lang="en">viewfinder size (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The size of the viewfinder, expressed in mm.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderTotalPixels -->

    <owl:ObjectProperty rdf:about="&cameraontology;viewFinderTotalPixels">
        <rdfs:label xml:lang="en">viewfinder total pixels (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The total number of pixels on the viewfinder.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#weightBodyOnly -->

    <owl:ObjectProperty rdf:about="&cameraontology;weightBodyOnly">
        <rdfs:label xml:lang="en">weight body only (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The &apos;weight&apos; property is used to express the weight of the device with accessories.
↪   The weight of the body can be expressed thru this relation.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#whiteBalanceMode -->

    <owl:ObjectProperty rdf:about="&cameraontology;whiteBalanceMode">
        <rdfs:label xml:lang="en">white balance mode (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A camera can have different White Balance modes.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#P_BAA564001 -->

    <owl:ObjectProperty rdf:about="&eco;P_BAA564001">
        <rdfs:label xml:lang="en">battery capacity (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Quantity of electricity or electric charge which a fully charged battery can discharge under
↪   given conditions.

Unit: mAh.</rdfs:comment>
        <rdfs:range rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;quantitativeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&cameraontology;BatteryGeneric"/>
    </owl:ObjectProperty>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#P_BAG977001 -->
```

```
    <owl:ObjectProperty rdf:about="&eco;P_BAG977001">
        <rdfs:label xml:lang="en">construction form (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A certain design in the context of a type which is generally distinguished by the
    ↪   design&amp;apos;s dimensions. A construction form can include several designs (variants) which are generally different in
    ↪   their mechanical details. [ObjectProperty]</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;qualitativeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&cameraontology;CameraType"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/depiction -->

    <owl:ObjectProperty rdf:about="&foaf;depiction">
        <rdfs:label xml:lang="en">depiction (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A depiction of some thing.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Image"/>
        <owl:inverseOf rdf:resource="&foaf;depicts"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/depicts -->

    <owl:ObjectProperty rdf:about="&foaf;depicts">
        <rdfs:label xml:lang="en">depicts (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A thing depicted in this representation.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Image"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/homepage -->

    <owl:ObjectProperty rdf:about="&foaf;homepage">
        <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
        <rdfs:label xml:lang="en">homepage (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A homepage for some thing.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Document"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;isPrimaryTopicOf"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;page"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/isPrimaryTopicOf -->

    <owl:ObjectProperty rdf:about="&foaf;isPrimaryTopicOf">
        <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
        <rdfs:label xml:lang="en">is primary topic of (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A document that this thing is the primary topic of.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Document"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;page"/>
        <owl:inverseOf rdf:resource="&foaf;primaryTopic"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/made -->

    <owl:ObjectProperty rdf:about="&foaf;made">
        <rdfs:label xml:lang="en">made (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">Something that was made by this agent.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;CreativeWork"/>
        <rdfs:domain rdf:resource="&foaf;Agent"/>
    </owl:ObjectProperty>

```

```
    <!-- http://xmlns.com/foaf/0.1/maker -->

    <owl:ObjectProperty rdf:about="&foaf;maker">
        <rdfs:label xml:lang="en">maker (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">An agent that made this thing.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <rdfs:range rdf:resource="&foaf;Agent"/>
        <owl:inverseOf rdf:resource="&foaf;made"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/page -->

    <owl:ObjectProperty rdf:about="&foaf;page">
        <rdfs:label xml:lang="en">page (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A page or document about this thing.</rdfs:comment>
        <rdfs:domain rdf:resource="&owl;Thing"/>
        <rdfs:range rdf:resource="&foaf;Document"/>
        <owl:inverseOf rdf:resource="&foaf;topic"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/primaryTopic -->

    <owl:ObjectProperty rdf:about="&foaf;primaryTopic">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">primary topic (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The primary topic of some page or document.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Document"/>
        <rdfs:subPropertyOf rdf:resource="&foaf;topic"/>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/thumbnail -->

    <owl:ObjectProperty rdf:about="&foaf;thumbnail">
        <rdf:type rdf:resource="&owl;AsymmetricProperty"/>
        <rdf:type rdf:resource="&owl;IrreflexiveProperty"/>
        <rdfs:label xml:lang="en">thumbnail (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A derived thumbnail image.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&s;ImageObject"/>
        <owl:inverseOf rdf:resource="&cameraontology;isFoafThumbnailOf"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;ImageObject"/>
                    <rdf:Description rdf:about="&s;VideoObject"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:ObjectProperty>



    <!-- http://xmlns.com/foaf/0.1/topic -->

    <owl:ObjectProperty rdf:about="&foaf;topic">
        <rdfs:label xml:lang="en">topic (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A topic of some page or document.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&owl;Thing"/>
        <rdfs:domain rdf:resource="&foaf;Document"/>
    </owl:ObjectProperty>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Data properties
```

```
8345    //
        ///////////////////////////////////////////////////////////////////////////////
         -->


8350


        <!-- http://ogp.me/ns#description -->

        <owl:DatatypeProperty rdf:about="&og;description">
8355        <rdfs:label xml:lang="en">description (0..1)</rdfs:label>
            <rdfs:comment xml:lang="en">A one to two sentence description of your object.</rdfs:comment>
            <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
            <owl:equivalentProperty rdf:resource="&dc;description"/>
            <owl:equivalentProperty rdf:resource="&dcterms;description"/>
8360        <owl:equivalentProperty rdf:resource="&gr;description"/>
            <owl:equivalentProperty rdf:resource="&s;description"/>
            <rdfs:range rdf:resource="&rdfs;Literal"/>
            <rdfs:domain rdf:resource="&owl;Thing"/>
        </owl:DatatypeProperty>
8365


        <!-- http://ogp.me/ns#locale -->

8370    <owl:DatatypeProperty rdf:about="&og;locale">
            <rdfs:label xml:lang="en">locale (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A Unix locale in which this markup is rendered. Of the format
    ↪   language_TERRITORY.</rdfs:comment>
            <owl:equivalentProperty rdf:resource="&dcterms;RFC5646"/>
8375        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
            <rdfs:range rdf:resource="&xsd;string"/>
        </owl:DatatypeProperty>


8380
        <!-- http://ogp.me/ns#title -->

        <owl:DatatypeProperty rdf:about="&og;title">
            <rdfs:label xml:lang="en">title (0..1)</rdfs:label>
8385        <rdfs:comment xml:lang="en">The title of your object as it should appear within the graph, e.g., &amp;quot;The
    ↪   Rock&amp;quot;.</rdfs:comment>
            <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
            <owl:equivalentProperty rdf:resource="&dc;title"/>
            <owl:equivalentProperty rdf:resource="&dcterms;title"/>
            <rdfs:range rdf:resource="&rdfs;Literal"/>
8390        <rdfs:domain rdf:resource="&owl;Thing"/>
        </owl:DatatypeProperty>



8395    <!-- http://ogp.me/ns#updated_time -->

        <owl:DatatypeProperty rdf:about="&og;updated_time">
            <rdfs:label xml:lang="en">updated time (0..1)</rdfs:label>
            <rdfs:comment xml:lang="en">The time when the object was last updated.</rdfs:comment>
8400        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
            <owl:equivalentProperty rdf:resource="&dcterms;modified"/>
            <owl:equivalentProperty rdf:resource="&s;dateModified"/>
            <rdfs:range rdf:resource="&rdfs;Literal"/>
            <rdfs:domain rdf:resource="&owl;Thing"/>
8405    </owl:DatatypeProperty>



        <!-- http://ogp.me/ns#url -->
8410
        <owl:DatatypeProperty rdf:about="&og;url">
            <rdfs:label xml:lang="en">url (1..1)</rdfs:label>
            <rdfs:comment xml:lang="en">The canonical URL of your object. In Open Graph Protocol this is used as its permanent ID in
    ↪   the graph, e.g., &amp;quot;http://www.imdb.com/title/tt0117500/&amp;quot;.</rdfs:comment>
            <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
8415        <rdfs:domain rdf:resource="&s;MediaObject"/>
            <owl:equivalentProperty rdf:resource="&s;contentUrl"/>
            <rdfs:range rdf:resource="&xsd;anyURI"/>
        </owl:DatatypeProperty>

8420
```

```
    <!-- http://ogp.me/ns#image:type -->

    <owl:DatatypeProperty rdf:about="&og;image:type">
        <rdfs:label xml:lang="en">image type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The mime type of an image.</rdfs:comment>
        <rdfs:domain rdf:resource="&og;Image"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://ogp.me/ns#video:type -->

    <owl:DatatypeProperty rdf:about="&og;video:type">
        <rdfs:label xml:lang="en">video type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The mime type of a video e.g., &quot;application/x-shockwave-flash&quot;</rdfs:comment>
        <rdfs:domain rdf:resource="&og;Video"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://ogp.me/ns/product#category -->

    <owl:DatatypeProperty rdf:about="&product;category">
        <rdfs:label xml:lang="en">category (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A category for the product.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&gr;category"/>
        <owl:equivalentProperty rdf:resource="&s;category"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://ogp.me/ns/product#color -->

    <owl:DatatypeProperty rdf:about="&product;color">
        <rdfs:label xml:lang="en">color (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A color describing the product.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <owl:equivalentProperty rdf:resource="&gr;color"/>
        <owl:equivalentProperty rdf:resource="&s;color"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://ogp.me/ns/product#condition -->

    <owl:DatatypeProperty rdf:about="&product;condition">
        <rdfs:label xml:lang="en">condition (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The condition of the item, one of &apos;new&apos;, &apos;refurbished&apos;, or
↪   &apos;used&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&gr;condition"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>
```

```
8500
        <!-- http://ogp.me/ns/product#ean -->

        <owl:DatatypeProperty rdf:about="&product;ean">
8505        <rdfs:label xml:lang="en">european article number (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">An International Article Number, or European Article Number (EAN), for the
        ↪   product.</rdfs:comment>
            <owl:equivalentProperty rdf:resource="&gr;hasEAN_UCC-13"/>
            <owl:equivalentProperty rdf:resource="&s;gtin13"/>
8510        <rdfs:range rdf:resource="&xsd;string"/>
            <rdfs:domain>
                <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
                        <rdf:Description rdf:about="&gr;Offering"/>
8515                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                    </owl:unionOf>
                </owl:Class>
            </rdfs:domain>
        </owl:DatatypeProperty>
8520


        <!-- http://ogp.me/ns/product#mfr_part_no -->

8525    <owl:DatatypeProperty rdf:about="&product;mfr_part_no">
            <rdfs:label xml:lang="en">manufacturer part number (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A manufacturer&apos;s part number for the product.</rdfs:comment>
            <owl:equivalentProperty rdf:resource="&gr;hasMPN"/>
8530        <owl:equivalentProperty rdf:resource="&s;mpn"/>
            <rdfs:range rdf:resource="&xsd;string"/>
            <rdfs:domain>
                <owl:Class>
                    <owl:unionOf rdf:parseType="Collection">
8535                    <rdf:Description rdf:about="&gr;Offering"/>
                        <rdf:Description rdf:about="&gr;ProductOrService"/>
                    </owl:unionOf>
                </owl:Class>
            </rdfs:domain>
8540    </owl:DatatypeProperty>


        <!-- http://ogp.me/ns/product#product_link -->
8545
        <owl:DatatypeProperty rdf:about="&product;product_link">
            <rdfs:label xml:lang="en">product link (0..*)</rdfs:label>
            <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A link to find out more about the product.</rdfs:comment>
8550        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
            <rdfs:range rdf:resource="&xsd;anyURI"/>
        </owl:DatatypeProperty>


8555
        <!-- http://ogp.me/ns/product#price:amount -->

        <owl:DatatypeProperty rdf:about="&product;price:amount">
            <rdfs:label xml:lang="en">price amount (0..1)</rdfs:label>
8560        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A decimal number with a &apos;.&apos; as the decimal separator. Values less than 0.01 are not
        ↪   supported.</rdfs:comment>
            <rdfs:domain rdf:resource="&product;pricespecification"/>
            <owl:equivalentProperty rdf:resource="&gr;hasCurrencyValue"/>
            <rdfs:subPropertyOf rdf:resource="&gr;hasMaxCurrencyValue"/>
8565        <rdfs:subPropertyOf rdf:resource="&gr;hasMinCurrencyValue"/>
            <owl:equivalentProperty rdf:resource="&s;price"/>
            <rdfs:range rdf:resource="&xsd;float"/>
        </owl:DatatypeProperty>

8570


        <!-- http://ogp.me/ns/product#price:currency -->

        <owl:DatatypeProperty rdf:about="&product;price:currency">
8575        <rdfs:label xml:lang="en">price currency (1..1)</rdfs:label>
```

```
        <rdfs:comment xml:lang="en">Currency is a string representing the ISO-4217-3 currency code.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&product;pricespecification"/>
        <owl:equivalentProperty rdf:resource="&gr;hasCurrency"/>
        <owl:equivalentProperty rdf:resource="&s;priceCurrency"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/elements/1.1/date -->

    <owl:DatatypeProperty rdf:about="&dc;date">
        <rdfs:label xml:lang="en">date (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A point or period of time associated with an event in the lifecycle of the resource.

Date may be used to express temporal information at any level of granularity.  Recommended best practice is to use an encoding
  ↪    scheme, such as the W3CDTF profile of ISO 8601 [W3CDTF].</rdfs:comment>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&dcterms;date"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/elements/1.1/description -->

    <owl:DatatypeProperty rdf:about="&dc;description">
        <rdfs:label xml:lang="en">description (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An account of the resource.

Description may include but is not limited to: an abstract, a table of contents, a graphical representation, or a free-text
  ↪    account of the resource.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&dcterms;description"/>
        <owl:equivalentProperty rdf:resource="&gr;description"/>
        <owl:equivalentProperty rdf:resource="&s;description"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/elements/1.1/subject -->

    <owl:DatatypeProperty rdf:about="&dc;subject">
        <rdfs:label xml:lang="en">subject (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:comment xml:lang="en">The topic of the resource.

Typically, the subject will be represented using keywords, key phrases, or classification codes. Recommended best practice is to
  ↪    use a controlled vocabulary.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&dcterms;subject"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/elements/1.1/title -->

    <owl:DatatypeProperty rdf:about="&dc;title">
        <rdfs:label xml:lang="en">title (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/elements/1.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A name given to the resource.</rdfs:comment>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
  ↪    namespace (http://purl.org/dc/terms/).  See the Introduction to the document &quot;DCMI Metadata Terms&quot;
  ↪    (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <owl:equivalentProperty rdf:resource="&dcterms;title"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://purl.org/dc/terms/RFC5646 -->

    <owl:DatatypeProperty rdf:about="&dcterms;RFC5646">
        <rdfs:label xml:lang="en">has RFC 5646 locale (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The set of tags constructed according to RFC 5646 for the identification of languages.
RFC 5646 obsoletes RFC 4646.</rdfs:comment>
        <rdfs:seeAlso>http://www.ietf.org/rfc/rfc5646.txt</rdfs:seeAlso>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/available -->

    <owl:DatatypeProperty rdf:about="&dcterms;available">
        <rdfs:label xml:lang="en">date available (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Date (often a range) that the resource became or will become available.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;date"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;date"/>
        <owl:equivalentProperty rdf:resource="&s;releaseDate"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/created -->

    <owl:DatatypeProperty rdf:about="&dcterms;created">
        <rdfs:label xml:lang="en">date created (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Date of creation of the resource.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;date"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;date"/>
        <owl:equivalentProperty rdf:resource="&s;dateCreated"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/date -->

    <owl:DatatypeProperty rdf:about="&dcterms;date">
        <rdfs:label xml:lang="en">date (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A point or period of time associated with an event in the lifecycle of the resource.
Date may be used to express temporal information at any level of granularity.  Recommended best practice is to use an encoding
  ↪    scheme, such as the W3CDTF profile of ISO 8601 [W3CDTF].</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;date"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/description -->

    <owl:DatatypeProperty rdf:about="&dcterms;description">
        <rdfs:label xml:lang="en">description (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">An account of the resource.
Description may include but is not limited to: an abstract, a table of contents, a graphical representation, or a free-text
  ↪    account of the resource.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;description"/>
        <owl:equivalentProperty rdf:resource="&gr;description"/>
        <owl:equivalentProperty rdf:resource="&s;description"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://purl.org/dc/terms/modified -->

    <owl:DatatypeProperty rdf:about="&dcterms;modified">
        <rdfs:label xml:lang="en">date modified (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Date on which the resource was changed.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;date"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;date"/>
        <owl:equivalentProperty rdf:resource="&s;dateModified"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/subject -->

    <owl:DatatypeProperty rdf:about="&dcterms;subject">
        <rdfs:label xml:lang="en">subject (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The topic of the resource.

Typically, the subject will be represented using keywords, key phrases, or classification codes. Recommended best practice is to
  ↪   use a controlled vocabulary.</rdfs:comment>
        <skos:note xml:lang="en">This term is intended to be used with non-literal values as defined in the DCMI Abstract Model
  ↪   (http://dublincore.org/documents/abstract-model/).  As of December 2007, the DCMI Usage Board is seeking a way to express
  ↪   this intention with a formal range declaration.</skos:note>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;subject"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/dc/terms/title -->

    <owl:DatatypeProperty rdf:about="&dcterms;title">
        <rdfs:label xml:lang="en">title (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A name given to the resource.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&dc;title"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/goodrelations/v1#amountOfThisGood -->

    <owl:DatatypeProperty rdf:about="&gr;amountOfThisGood">
        <rdfs:label xml:lang="en">amount of this good (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property specifies the quantity of the goods included in the gr:Offering via this
  ↪   gr:TypeAndQuantityNode. The quantity is given in the unit of measurement attached to the
  ↪   gr:TypeAndQuantityNode.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;TypeAndQuantityNode"/>
        <owl:equivalentProperty rdf:resource="&s;amountOfThisGood"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/goodrelations/v1#category -->

    <owl:DatatypeProperty rdf:about="&gr;category">
        <rdfs:label xml:lang="en">category (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The name of a category to which this gr:ProductOrService, gr:Offering, gr:BusinessEntity, or
  ↪   gr:Location belongs.

Note 1: For products, it is better to add an rdf:type statement referring to a GoodRelations-compliant ontology for vertical
  ↪   industries instead, but if you just have a short text label, gr:category is simpler.
Note 2: You can use greater signs or slashes to informally indicate a category hierarchy, e.g.
  ↪   &amp;quot;restaurants/asian_restaurants&amp;quot; or &amp;quot;cables &amp;gt; usb_cables&amp;quot;</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&s;category"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
```

```
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;BusinessEntity"/>
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#color -->

    <owl:DatatypeProperty rdf:about="&gr;color">
        <rdfs:label xml:lang="en">color (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The color of the product.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <owl:equivalentProperty rdf:resource="&s;color"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#condition -->

    <owl:DatatypeProperty rdf:about="&gr;condition">
        <rdfs:label xml:lang="en">condition (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A textual description of the condition of the product or service, or the products or services
  ↪   included in the offer (when attached to a gr:Offering)</rdfs:comment>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#datatypeProductOrServiceProperty -->

    <owl:DatatypeProperty rdf:about="&gr;datatypeProductOrServiceProperty">
        <rdfs:label xml:lang="en">datatype product or service property (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property is the super property for all pure datatype properties that can be used to
  ↪   describe a gr:ProductOrService.

In products and services ontologies, only such properties that are no quantitative properties and that have no predefined
  ↪   gr:QualitativeValue instances are subproperties of this property. In practice, this refers to a few integer properties
  ↪   for which the integer value represents qualitative aspects, for string datatypes (as long as no predefined values exist),
  ↪   for boolean datatype properties, and for dates and times.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#description -->

    <owl:DatatypeProperty rdf:about="&gr;description">
        <rdfs:label xml:lang="en">description (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A short textual description of the resource.

This property is semantically equivalent to rdfs:comment and just meant as a handy shortcut for marking up data.</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&s;description"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://purl.org/goodrelations/v1#eligibleRegions -->

    <owl:DatatypeProperty rdf:about="&gr;eligibleRegions">
        <rdfs:label xml:lang="en">eligible regions (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property specifies the geo-political region or regions for which the gr:Offering,
  ↪    gr:License, or gr:DeliveryChargeSpecification is valid using the two-character version of ISO 3166-1 (ISO 3166-1 alpha-2)
  ↪     for regions or ISO 3166-2 , which breaks down the countries from ISO 3166-1 into administrative subdivisions.

Important: Do NOT use 3-letter ISO 3166-1 codes!</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;Offering"/>
        <owl:equivalentProperty rdf:resource="&s;eligibleRegion"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasCurrency -->

    <owl:DatatypeProperty rdf:about="&gr;hasCurrency">
        <rdfs:label xml:lang="en">has currency (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The currency for all prices in the gr:PriceSpecification given using the ISO 4217 standard
  ↪    (3 characters).</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
        <owl:equivalentProperty rdf:resource="&s;priceCurrency"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/goodrelations/v1#hasCurrencyValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasCurrencyValue">
        <rdfs:label xml:lang="en">has currency value (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property specifies the amount of money for a price per unit, shipping charges, or
  ↪    payment charges. The currency and other relevant details are attached to the respective gr:PriceSpecification etc.

For a gr:UnitPriceSpecification, this is the price for one unit or bundle (as specified in the unit of measurement of the unit
  ↪    price specification) of the respective gr:ProductOrService. For a gr:DeliveryChargeSpecification or a
  ↪    gr:PaymentChargeSpecification, it is the price per delivery or payment.

GoodRelations also supports giving price information as intervals only. If this is needed, use gr:hasMaxCurrencyValue for the
  ↪    upper bound and gr:hasMinCurrencyValue for the lower bound.

Using gr:hasCurrencyValue sets the upper and lower bounds to the same given value, i.e., x gr:hasCurrencyValue y implies x
  ↪    gr:hasMinCurrencyValue y, x gr:hasMaxCurrencyValue y.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxCurrencyValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinCurrencyValue"/>
        <owl:equivalentProperty rdf:resource="&s;price"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasEAN_UCC-13 -->

    <owl:DatatypeProperty rdf:about="&gr;hasEAN_UCC-13">
        <rdfs:label xml:lang="en">has EAN/UCC-13 (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The EAN·UCC-13 code of the given gr:ProductOrService or gr:Offering. This code is now
  ↪    officially called GTIN-13 (Global Trade Identifier Number) or EAN·UCC-13. Former 12-digit UPC codes can be converted into
  ↪    EAN·UCC-13 code by simply adding a preceeding zero.

Note 1: When using this property for searching by 12-digit UPC codes, you must add a preceeding zero digit.
Note 2: As of January 1, 2007, the former ISBN numbers for books etc. have been integrated into the EAN·UCC-13 code. For each
  ↪    old ISBN-10 code, there exists a proper translation into EAN·UCC-13 by adding &amp;quot;978&amp;quot; or &amp;quot;979&amp;quot; as
  ↪    prefix. Since the old ISBN-10 is now deprecated, GoodRelations does not provide a property for ISBNs.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <owl:equivalentProperty rdf:resource="&s;gtin13"/>
        <rdfs:subPropertyOf rdf:resource="&s;productID"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
```

```
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://purl.org/goodrelations/v1#hasMPN -->

    <owl:DatatypeProperty rdf:about="&gr;hasMPN">
        <rdfs:label xml:lang="en">has MPN (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Manufacturer Part Number or MPN is a unique identifier for a product, service, or bundle
  ↪    from the perspective of a particular manufacturer. MPNs can be assigned to products or product datasheets, or bundles.
  ↪    Accordingly, the domain of this property is the union of gr:ProductOrService (the common superclass of goods and
  ↪    datasheets), and gr:Offering.

Important: Be careful when assuming two products or services instances or offering instances to be identical based on the MPN.
  ↪    Since MPNs are unique only for the same gr:BusinessEntity, this holds only when the two MPN values refer to the same
  ↪    gr:BusinessEntity. Such can be done by taking into account the provenance of the data.

Usually, the properties gr:hasEAN_UCC-13 and gr:hasGTIN-14 are much more reliable identifiers, because they are globally unique.

See also http://en.wikipedia.org/wiki/Part_number</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&s;mpn"/>
        <rdfs:subPropertyOf rdf:resource="&s;productID"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMaxCurrencyValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasMaxCurrencyValue">
        <rdfs:label xml:lang="en">has max currency value (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property specifies the UPPER BOUND of the amount of money for a price RANGE per unit,
  ↪    shipping charges, or payment charges. The currency and other relevant details are attached to the respective
  ↪    gr:PriceSpecification etc.
For a gr:UnitPriceSpecification, this is the UPPER BOUND for the price for one unit or bundle (as specified in the unit of
  ↪    measurement of the unit price specification) of the respective gr:ProductOrService. For a gr:DeliveryChargeSpecification
  ↪    or a gr:PaymentChargeSpecification, it is the UPPER BOUND of the price per delivery or payment.

Using gr:hasCurrencyValue sets the upper and lower bounds to the same given value, i.e., x gr:hasCurrencyValue y implies x
  ↪    gr:hasMinCurrencyValue y, x gr:hasMaxCurrencyValue y.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
        <owl:equivalentProperty rdf:resource="&s;maxPrice"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMaxValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasMaxValue">
        <rdfs:label xml:lang="en">has max value (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property captures the upper limit of a gr:QuantitativeValue instance.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMaxValueFloat -->

    <owl:DatatypeProperty rdf:about="&gr;hasMaxValueFloat">
        <rdfs:label xml:lang="en">has max value float (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property captures the upper limit of a gr:QuantitativeValueFloat
  ↪    instance.</rdfs:comment>
```

```
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxValue"/>
        <owl:equivalentProperty rdf:resource="&s;maxValue"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>


    <!-- http://purl.org/goodrelations/v1#hasMaxValueInteger -->

    <owl:DatatypeProperty rdf:about="&gr;hasMaxValueInteger">
        <rdfs:label xml:lang="en">has max value integer (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This property captures the upper limit of a gr:QuantitativeValueInteger
  ↪    instance.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxValue"/>
        <rdfs:range rdf:resource="&xsd;int"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMinCurrencyValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasMinCurrencyValue">
        <rdfs:label xml:lang="en">has min currency value (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property specifies the LOWER BOUND of the amount of money for a price RANGE per unit,
  ↪    shipping charges, or payment charges. The currency and other relevant details are attached to the respective
  ↪    gr:PriceSpecification etc.
For a gr:UnitPriceSpecification, this is the LOWER BOUND for the price for one unit or bundle (as specified in the unit of
  ↪    measurement of the unit price specification) of the respective gr:ProductOrService. For a gr:DeliveryChargeSpecification
  ↪    or a gr:PaymentChargeSpecification, it is the LOWER BOUND of the price per delivery or payment.

Using gr:hasCurrencyValue sets the upper and lower bounds to the same given value, i.e., x gr:hasCurrencyValue y implies x
  ↪    gr:hasMinCurrencyValue y, x gr:hasMaxCurrencyValue y.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
        <owl:equivalentProperty rdf:resource="&s;minPrice"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMinValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasMinValue">
        <rdfs:label xml:lang="en">has min value (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property captures the lower limit of a gr:QuantitativeValue instance.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMinValueFloat -->

    <owl:DatatypeProperty rdf:about="&gr;hasMinValueFloat">
        <rdfs:label xml:lang="en">has min value float (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This property captures the lower limit of a gr:QuantitativeValueFloat
  ↪    instance.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinValue"/>
        <owl:equivalentProperty rdf:resource="&s;minValue"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasMinValueInteger -->

    <owl:DatatypeProperty rdf:about="&gr;hasMinValueInteger">
        <rdfs:label xml:lang="en">has min value integer (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This property captures the lower limit of a gr:QuantitativeValueInteger
  ↪    instance.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinValue"/>
```

```
        <rdfs:range rdf:resource="&xsd;int"/>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasStockKeepingUnit -->

    <owl:DatatypeProperty rdf:about="&gr;hasStockKeepingUnit">
        <rdfs:label xml:lang="en">has Stock Keeping Unit (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The Stock Keeping Unit, or SKU is a unique identifier for a product, service, or bundle from
  ↪    the perspective of a particular supplier, i.e. SKUs are mostly assigned and serialized at the merchant level.
Examples of SKUs are the ordering or parts numbers used by a particular Web shop or catalog.

Consequently, the domain of gr:hasStockKeepingUnit is the union of the classes gr:Offering and gr:ProductOrService.
If attached to a gr:Offering, the SKU will usually reflect a merchant-specific identifier, i.e. one valid only for that
  ↪    particular retailer or shop.
If attached to a gr:ProductOrServiceModel, the SKU can reflect either the identifier used by the merchant or the part number
  ↪    used by the official manufacturer of that part. For the latter, gr:hasMPN is a better choice.

Important: Be careful when assuming two products or services instances or offering instances to be identical based on the SKU.
  ↪    Since SKUs are unique only for the same gr:BusinessEntity, this can be assumed only when you are sure that the two SKU
  ↪    values refer to the same business entity. Such can be done by taking into account the provenance of the data. As long as
  ↪    instances of gr:Offering are concerned, you can also check that the offerings are being offered by the same gr:Business
  ↪    Entity.

Usually, the properties gr:hasEAN_UCC-13 and gr:hasGTIN-14 are much more reliable identifiers, because they are globally unique.

See also http://en.wikipedia.org/wiki/Stock_Keeping_Unit.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&s;productID"/>
        <owl:equivalentProperty rdf:resource="&s;sku"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;Offering"/>
                    <rdf:Description rdf:about="&gr;ProductOrService"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasUnitOfMeasurement -->

    <owl:DatatypeProperty rdf:about="&gr;hasUnitOfMeasurement">
        <rdfs:label xml:lang="en">has unit of measurement (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The unit of measurement for a gr:QuantitativeValue, a gr:UnitPriceSpecification, or a
  ↪    gr:TypeAndQuantityNode given using the UN/CEFACT Common Code (3 characters).</rdfs:comment>
        <owl:equivalentProperty rdf:resource="&s;unitCode"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&gr;QuantitativeValue"/>
                    <rdf:Description rdf:about="&gr;TypeAndQuantityNode"/>
                    <rdf:Description rdf:about="&gr;UnitPriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://purl.org/goodrelations/v1#hasValue -->

    <owl:DatatypeProperty rdf:about="&gr;hasValue">
        <rdfs:label xml:lang="en">has value (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This subproperty specifies that the upper and lower limit of the given gr:QuantitativeValue
  ↪    are identical and have the respective value. It is a shortcut for such cases where a quantitative property is (at least
  ↪    practically) a single point value and not an interval.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinValue"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>
```

```
9145
    <!-- http://purl.org/goodrelations/v1#hasValueFloat -->

    <owl:DatatypeProperty rdf:about="&gr;hasValueFloat">
9150        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">has value float (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This subproperty specifies that the upper and lower limit of the given
  ↪    gr:QuantitativeValueFloat are identical and have the respective float value. It is a shortcut for such cases where a
  ↪    quantitative property is (at least practically) a single point value and not an interval.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;QuantitativeValueFloat"/>
9155        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxValueFloat"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinValueFloat"/>
        <owl:equivalentProperty rdf:resource="&s;value"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>
9160

    <!-- http://purl.org/goodrelations/v1#hasValueInteger -->

9165    <owl:DatatypeProperty rdf:about="&gr;hasValueInteger">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">has value integer (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This subproperty specifies that the upper and lower limit of the given
  ↪    gr:QuantitativeValueInteger are identical and have the respective integer value. It is a shortcut for such cases where a
  ↪    quantitative property is (at least practically) a single point value and not an interval.</rdfs:comment>
9170        <rdfs:domain rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxValueInteger"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinValueInteger"/>
        <rdfs:range rdf:resource="&xsd;int"/>
    </owl:DatatypeProperty>
9175

    <!-- http://purl.org/goodrelations/v1#legalName -->

9180    <owl:DatatypeProperty rdf:about="&gr;legalName">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">legal name (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The legal name of the gr:BusinessEntity.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
9185        <rdfs:domain rdf:resource="&gr;BusinessEntity"/>
        <owl:equivalentProperty rdf:resource="&s;legalName"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>

9190

    <!-- http://purl.org/goodrelations/v1#name -->

    <owl:DatatypeProperty rdf:about="&gr;name">
9195        <rdfs:label xml:lang="en">name (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A short text describing the respective resource.

This property is semantically equivalent to dcterms:title and rdfs:label and just meant as a handy shortcut for marking up
  ↪    data.</rdfs:comment>
9200        <owl:equivalentProperty rdf:resource="&s;name"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>

9205

    <!-- http://purl.org/goodrelations/v1#priceType -->

    <owl:DatatypeProperty rdf:about="&gr;priceType">
9210        <rdfs:label xml:lang="en">price type (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">This attribute can be used to distinguish multiple different price specifications for the
  ↪    same gr:Offering. It supersedes the former gr:isListPrice property. The following values are recommended:

The absence of this property marks the actual sales price.

9215    SRP: &amp;quot;suggested retail price&amp;quot; - applicable for all sorts of a non-binding retail price recommendations, e.g. such
  ↪    published by the manufacturer or the distributor. This value replaces the former gr:isListPrice property.
```

```
INVOICE: The invoice price, mostly used in the car industry - this is the price a dealer pays to the manufacturer, excluding
  ↪    rebates and charges.</rdfs:comment>
       <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
       <rdfs:domain rdf:resource="&gr;UnitPriceSpecification"/>
       <owl:equivalentProperty rdf:resource="&s;priceType"/>
       <rdfs:range rdf:resource="&xsd;string"/>
   </owl:DatatypeProperty>


   <!-- http://purl.org/goodrelations/v1#serialNumber -->

   <owl:DatatypeProperty rdf:about="&gr;serialNumber">
       <rdfs:label xml:lang="en">serial number (0..*)</rdfs:label>
       <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
       <rdfs:comment xml:lang="en">The serial number or any alphanumeric identifier of a particular product. Note that serial
  ↪    number are unique only for the same brand or the same model, so you cannot infer from two occurrences of the same serial
  ↪    number that the objects to which they are attached are identical.

This property can also be attached to a gr:Offering in cases where the included products are not modeled in more
  ↪    detail.</rdfs:comment>
       <owl:equivalentProperty rdf:resource="&s;serialNumber"/>
       <rdfs:range rdf:resource="&xsd;string"/>
       <rdfs:domain>
           <owl:Class>
               <owl:unionOf rdf:parseType="Collection">
                   <rdf:Description rdf:about="&gr;Individual"/>
                   <rdf:Description rdf:about="&gr;Offering"/>
               </owl:unionOf>
           </owl:Class>
       </rdfs:domain>
   </owl:DatatypeProperty>


   <!-- http://purl.org/goodrelations/v1#valueAddedTaxIncluded -->

   <owl:DatatypeProperty rdf:about="&gr;valueAddedTaxIncluded">
       <rdfs:label xml:lang="en">value added tax included (0..1)</rdfs:label>
       <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
       <rdfs:comment xml:lang="en">This property specifies whether the applicable value-added tax (VAT)  is included in the
  ↪    price of the gr:PriceSpecification or not.

Note: This is a simple representation which may not properly reflect all details of local taxation.</rdfs:comment>
       <rdfs:domain rdf:resource="&gr;PriceSpecification"/>
       <owl:equivalentProperty rdf:resource="&s;valueAddedTaxIncluded"/>
       <rdfs:range rdf:resource="&xsd;boolean"/>
   </owl:DatatypeProperty>


   <!-- http://schema.org/amountOfThisGood -->

   <owl:DatatypeProperty rdf:about="&s;amountOfThisGood">
       <rdfs:label xml:lang="en">amount of this good (1..1)</rdfs:label>
       <rdfs:isDefinedBy>http://schema.org/amountOfThisGood</rdfs:isDefinedBy>
       <rdfs:comment xml:lang="en">The quantity of the goods included in the offer.</rdfs:comment>
       <rdfs:domain rdf:resource="&s;TypeAndQuantityNode"/>
       <rdfs:range rdf:resource="&xsd;float"/>
   </owl:DatatypeProperty>


   <!-- http://schema.org/bestRating -->

   <owl:DatatypeProperty rdf:about="&s;bestRating">
       <rdfs:label xml:lang="en">best rating (0..1)</rdfs:label>
       <rdfs:comment xml:lang="en">The highest value allowed in this rating system. If bestRating is omitted, 5 is
  ↪    assumed.</rdfs:comment>
       <rdfs:isDefinedBy>http://schema.org/bestRating</rdfs:isDefinedBy>
       <rdfs:domain rdf:resource="&s;Rating"/>
       <rdfs:range rdf:resource="&xsd;float"/>
   </owl:DatatypeProperty>


   <!-- http://schema.org/category -->
```

```
    <owl:DatatypeProperty rdf:about="&s;category">
        <rdfs:label xml:lang="en">category (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">A category for the item. Greater signs or slashes can be used to informally indicate a
    ↪   category hierarchy.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/category</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://schema.org/color -->

    <owl:DatatypeProperty rdf:about="&s;color">
        <rdfs:label xml:lang="en">color (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The color of the product.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/color</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;Product"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/contentSize -->

    <owl:DatatypeProperty rdf:about="&s;contentSize">
        <rdfs:label xml:lang="en">content size (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">File size in (mega/kilo) bytes.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/contentSize</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;MediaObject"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/contentUrl -->

    <owl:DatatypeProperty rdf:about="&s;contentUrl">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">content url (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/contentUrl</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Actual bytes of the media object, for example the image file or video file. (previous
    ↪   spelling: contentURL)</rdfs:comment>
        <rdfs:domain rdf:resource="&s;MediaObject"/>
        <rdfs:range rdf:resource="&xsd;anyURI"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/dateCreated -->

    <owl:DatatypeProperty rdf:about="&s;dateCreated">
        <rdfs:label xml:lang="en">date created (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/dateCreated</rdfs:isDefinedBy>
        <skos:note xml:lang="en">A second property with the same name as this property has been declared in the dcterms:
    ↪   namespace (http://purl.org/dc/terms/).  See the Introduction to the document &amp;quot;DCMI Metadata Terms&amp;quot;
    ↪   (http://dublincore.org/documents/dcmi-terms/) for an explanation.</skos:note>
        <rdfs:comment xml:lang="en">The date on which the CreativeWork was created.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>


    <!-- http://schema.org/dateModified -->

    <owl:DatatypeProperty rdf:about="&s;dateModified">
        <rdfs:label xml:lang="en">date modified (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/dateModified</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The date on which the CreativeWork was most recently modified.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
```

```
        <rdfs:range rdf:resource="&rdfs;Literal"/>
    </owl:DatatypeProperty>


    <!-- http://schema.org/description -->

    <owl:DatatypeProperty rdf:about="&s;description">
        <rdfs:label xml:lang="en">description (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A short description of the item.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/description</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>


    <!-- http://schema.org/eligibleRegion -->

    <owl:DatatypeProperty rdf:about="&s;eligibleRegion">
        <rdfs:label xml:lang="en">eligible region (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The ISO 3166-1 (ISO 3166-1 alpha-2) or ISO 3166-2 code, or the GeoShape for the geo-political
↪   region(s) for which the offer or delivery charge specification is valid.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/eligibleRegion</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;Offer"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://schema.org/encodingFormat -->

    <owl:DatatypeProperty rdf:about="&s;encodingFormat">
        <rdfs:label xml:lang="en">encoding format (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/encodingFormat</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">mp3, mpeg4, etc.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;MediaObject"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://schema.org/gtin13 -->

    <owl:DatatypeProperty rdf:about="&s;gtin13">
        <rdfs:label xml:lang="en">gtin13 (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/gtin13</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The &lt;a
↪   href=&amp;quot;http://apps.gs1.org/GDD/glossary/Pages/GTIN-13.aspx&amp;quot;&gt;GTIN-13&lt;/a&gt; code of the product,
↪   or the product to which the offer refers. This is equivalent to 13-digit ISBN codes and EAN UCC-13. Former 12-digit UPC
↪   codes can be converted into a GTIN-13 code by simply adding a preceeding zero. See &lt;a
↪   href=&amp;quot;http://www.gs1.org/barcodes/technical/idkeys/gtin&amp;quot;&gt;GS1 GTIN Summary&lt;/a&gt; for more
↪   details.</rdfs:comment>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://schema.org/legalName -->

    <owl:DatatypeProperty rdf:about="&s;legalName">
        <rdf:type rdf:resource="&owl;FunctionalProperty"/>
        <rdfs:label xml:lang="en">legal name (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/legalName</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The official name of the organization, e.g. the registered company name.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;Organization"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://schema.org/maxPrice -->

    <owl:DatatypeProperty rdf:about="&s;maxPrice">
        <rdfs:label xml:lang="en">max price (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/maxPrice</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The highest price if the price is a range.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;PriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/maxValue -->

    <owl:DatatypeProperty rdf:about="&s;maxValue">
        <rdfs:label xml:lang="en">max value (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The upper value of some characteristic or property.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/maxValue</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;QuantitativeValue"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/minPrice -->

    <owl:DatatypeProperty rdf:about="&s;minPrice">
        <rdfs:label xml:lang="en">min price (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The lowest price if the price is a range.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/minPrice</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;PriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/minValue -->

    <owl:DatatypeProperty rdf:about="&s;minValue">
        <rdfs:label xml:lang="en">min value (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The lower value of some characteristic or property.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/minValue</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;QuantitativeValue"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/mpn -->

    <owl:DatatypeProperty rdf:about="&s;mpn">
        <rdfs:label xml:lang="en">mpn (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The Manufacturer Part Number (MPN) of the product, or the product to which the offer
↪   refers.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/mpn</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://schema.org/name -->

    <owl:DatatypeProperty rdf:about="&s;name">
        <rdfs:label xml:lang="en">name (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/name</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The name of the item.</rdfs:comment>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://schema.org/price -->

    <owl:DatatypeProperty rdf:about="&s;price">
        <rdfs:label xml:lang="en">price (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The offer price of a product, or of a price component when attached to PriceSpecification and
  ↪    its subtypes.
&lt;br /&gt;
&lt;br /&gt;
Usage guidelines:
&lt;br /&gt;
&lt;ul&gt;
&lt;li&gt;Use the &lt;a href=&quot;/priceCurrency&quot;&gt;priceCurrency&lt;/a&gt; property (with &lt;a
  ↪    href=&quot;http://en.wikipedia.org/wiki/ISO_4217#Active_codes&quot;&gt;ISO 4217 codes&lt;/a&gt; e.g. &quot;USD&quot;)
  ↪    instead of including &lt;a
  ↪    href=&quot;http://en.wikipedia.org/wiki/Dollar_sign#Currencies_that_use_the_dollar_or_peso_sign&quot;&gt;ambiguous
  ↪    symbols&lt;/a&gt; such as &apos;$&apos; in the value.&lt;/li&gt;
&lt;li&gt;Use &apos;.&apos; (Unicode &apos;FULL STOP&apos; (U+002E)) rather than &apos;,&apos; to indicate a decimal point.
  ↪    Avoid using these symbols as a readability separator.&lt;/li&gt;
&lt;li&gt;Note that both &lt;a
  ↪    href=&quot;http://www.w3.org/TR/xhtml-rdfa-primer/#using-the-content-attribute&quot;&gt;RDFa&lt;/a&gt; and Microdata
  ↪    syntax allow the use of a &quot;content=&quot; attribute for publishing simple machine-readable values alongside more
  ↪    human-friendly formatting.&lt;/li&gt;
&lt;li&gt;Use values from 0123456789 (Unicode &apos;DIGIT ZERO&apos; (U+0030) to &apos;DIGIT NINE&apos; (U+0039)) rather than
  ↪    superficially similiar Unicode symbols.&lt;/li&gt;
&lt;/ul&gt;</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/price</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMaxCurrencyValue"/>
        <rdfs:subPropertyOf rdf:resource="&gr;hasMinCurrencyValue"/>
        <rdfs:domain rdf:resource="&s;PriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/priceCurrency -->

    <owl:DatatypeProperty rdf:about="&s;priceCurrency">
        <rdfs:label xml:lang="en">price currency (1..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The currency (in 3-letter ISO 4217 format) of the price or a price component, when attached
  ↪    to PriceSpecification and its subtypes.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/priceCurrency</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;PriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/priceType -->

    <owl:DatatypeProperty rdf:about="&s;priceType">
        <rdfs:label xml:lang="en">price type (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A short text or acronym indicating multiple price specifications for the same offer, e.g.
  ↪    SRP for the suggested retail price or INVOICE for the invoice price, mostly used in the car industry.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/priceType</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;UnitPriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/productID -->

    <owl:DatatypeProperty rdf:about="&s;productID">
        <rdfs:label xml:lang="en">product ID (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/productID</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The product identifier, such as ISBN. For example: &lt;meta itemprop=&apos;productID&apos;
  ↪    content=&apos;isbn:123-456-789&apos;/&gt;.</rdfs:comment>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>
```

```
    <!-- http://schema.org/ratingCount -->

    <owl:DatatypeProperty rdf:about="&s;ratingCount">
        <rdfs:label xml:lang="en">rating count (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The count of total number of ratings.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/ratingCount</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;AggregateRating"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/ratingValue -->

    <owl:DatatypeProperty rdf:about="&s;ratingValue">
        <rdfs:label xml:lang="en">rating value (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The rating for the content.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/ratingValue</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;Rating"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/releaseDate -->

    <owl:DatatypeProperty rdf:about="&s;releaseDate">
        <rdfs:label xml:lang="en">release date (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The release date of a product or product model. This can be used to distinguish the exact
↪   variant of a product.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/releaseDate</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;Product"/>
        <rdfs:range rdf:resource="&xsd;dateTime"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/reviewCount -->

    <owl:DatatypeProperty rdf:about="&s;reviewCount">
        <rdfs:label xml:lang="en">review count (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/reviewCount</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The count of total number of reviews.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;AggregateRating"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/serialNumber -->

    <owl:DatatypeProperty rdf:about="&s;serialNumber">
        <rdfs:label xml:lang="en">serial number (0..*)</rdfs:label>
        <rdfs:comment xml:lang="en">The serial number or any alphanumeric identifier of a particular product. When attached to
↪   an offer, it is a shortcut for the serial number of the product included in the offer.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/serialNumber</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;IndividualProduct"/>
                    <rdf:Description rdf:about="&s;Offer"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://schema.org/sku -->

    <owl:DatatypeProperty rdf:about="&s;sku">
        <rdfs:label xml:lang="en">sku (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/sku</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Stock Keeping Unit (SKU), i.e. a merchant-specific identifier for a product or service,
↪   or the product to which the offer refers.</rdfs:comment>
        <rdfs:range rdf:resource="&xsd;string"/>
```

```
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Offer"/>
                    <rdf:Description rdf:about="&s;Product"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://schema.org/unitCode -->

    <owl:DatatypeProperty rdf:about="&s;unitCode">
        <rdfs:label xml:lang="en">unit code (1..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/unitCode</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The unit of measurement given using the UN/CEFACT Common Code (3 characters).</rdfs:comment>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;QuantitativeValue"/>
                    <rdf:Description rdf:about="&s;TypeAndQuantityNode"/>
                    <rdf:Description rdf:about="&s;UnitPriceSpecification"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://schema.org/value -->

    <owl:DatatypeProperty rdf:about="&s;value">
        <rdfs:label xml:lang="en">value (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/value</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The value of the product characteristic.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;QuantitativeValue"/>
        <rdfs:subPropertyOf rdf:resource="&s;maxValue"/>
        <rdfs:subPropertyOf rdf:resource="&s;minValue"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/valueAddedTaxIncluded -->

    <owl:DatatypeProperty rdf:about="&s;valueAddedTaxIncluded">
        <rdfs:label xml:lang="en">value added tax included (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/valueAddedTaxIncluded</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Specifies whether the applicable value-added tax (VAT) is included in the price
↪   specification or not.</rdfs:comment>
        <rdfs:domain rdf:resource="&s;PriceSpecification"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/version -->

    <owl:DatatypeProperty rdf:about="&s;version">
        <rdfs:label xml:lang="en">version (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The version of the CreativeWork embodied by a specified resource.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/version</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;CreativeWork"/>
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://schema.org/worstRating -->

    <owl:DatatypeProperty rdf:about="&s;worstRating">
        <rdfs:label xml:lang="en">worst rating (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The lowest value allowed in this rating system. If worstRating is omitted, 1 is
↪   assumed.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/worstRating</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&s;Rating"/>
```

```
        <rdfs:range rdf:resource="&xsd;float"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#alternativeName -->

    <owl:DatatypeProperty rdf:about="&cameraontology;alternativeName">
        <rdfs:label xml:lang="en">alternative name (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An alternative name for a product or service.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#code -->

    <owl:DatatypeProperty rdf:about="&cameraontology;code">
        <rdfs:label xml:lang="en">code (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A short code identifying the respective resource.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&cameraontology;ContentFile"/>
                    <rdf:Description rdf:about="&cameraontology;ContentSubType"/>
                    <rdf:Description rdf:about="&cameraontology;ContentType"/>
                    <rdf:Description rdf:about="&cameraontology;ProductCategory"/>
                    <rdf:Description rdf:about="&cameraontology;ProductSeries"/>
                    <rdf:Description rdf:about="&cameraontology;ProductSubCategory"/>
                    <rdf:Description rdf:about="&cameraontology;ProductType"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#displayAspectRatio -->

    <owl:DatatypeProperty rdf:about="&cameraontology;displayAspectRatio">
        <rdfs:label xml:lang="en">display aspect ratio (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The aspect ratio of the display, e.g. 16:9 or 4:3.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#displayResolution -->

    <owl:DatatypeProperty rdf:about="&cameraontology;displayResolution">
        <rdfs:label xml:lang="en">display resolution (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The resolution of the display of a camera. In the form of WidthXHeight or
↪   WidthXColorDepthXHeight where X is the separator.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#displayType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;displayType">
        <rdfs:label xml:lang="en">display type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The type of the display. Common values include: &apos;LCD&apos; and
↪   &apos;OLED&apos;.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
```

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    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#fileVersion -->

    <owl:DatatypeProperty rdf:about="&cameraontology;fileVersion">
        <rdfs:label xml:lang="en">file version (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A Content File can have an associated file version.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasActiveZoom -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasActiveZoom">
        <rdfs:label xml:lang="en">has active zoom (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the camera supports active zoom.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasBlueTooth -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasBlueTooth">
        <rdfs:label xml:lang="en">has bluetooth (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the device supports BlueTooth.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasBuildInFlash -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasBuildInFlash">
        <rdfs:label xml:lang="en">has build in flash (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the Camera has a build in flash.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasCameraInterface -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasCameraInterface">
        <rdfs:label xml:lang="en">has camera interface (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the tripod has a camera interface. By default, this property should be true.
↪   See &apos;has tripod interface&apos; for more explaination.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasElectronicFocalPlane -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasElectronicFocalPlane">
        <rdfs:label xml:lang="en">has electronic focal plane (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">In camera design, a focal-plane shutter (FPS) is a type of photographic shutter that is
↪   positioned immediately in front of the focal plane of the camera, that is, right in front of the photographic film or
↪   image sensor.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
```

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        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasElectronicViewFinder -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasElectronicViewFinder">
        <rdfs:label xml:lang="en">has electronic viewfinder (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Does a camera have an electronic viewfinder?</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasGps -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasGps">
        <rdfs:label xml:lang="en">has gps (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the camera has a build in GPS.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasLensNd4xNeutralDensityFilter -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasLensNd4xNeutralDensityFilter">
        <rdfs:label xml:lang="en">has lens nd4x neutral density filter (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the lens has a &amp;apos;nd4x&amp;apos; neutral density filter.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasLensWeatherSealing -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasLensWeatherSealing">
        <rdfs:label xml:lang="en">has lens weather sealing (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the lens has weather sealing.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasManualProjectionFocus -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasManualProjectionFocus">
        <rdfs:label xml:lang="en">has manual projection focus (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Can the projection focus be manually altered?</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
```

```
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasMobilePhoneDisplayConnection -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasMobilePhoneDisplayConnection">
        <rdfs:label xml:lang="en">has mobile phone display connection (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not it is possible to use the display of a mobile phone as LCD.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasNetworkNfc -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasNetworkNfc">
        <rdfs:label xml:lang="en">has network nfc (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the device supports near field communication.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasNetworkWlan -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasNetworkWlan">
        <rdfs:label xml:lang="en">has network wlan (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the device supports WLAN.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasPassport -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasPassport">
        <rdfs:label xml:lang="en">has passport (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Does the product have any associated file that describes the technical features of the
 ↪  product?

Such a file is called a Passport in the Sony terminology.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasPreFlashControl -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasPreFlashControl">
        <rdfs:label xml:lang="en">has pre flash control (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the pre-flash can be controlled.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasStereoMiddleSlide -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasStereoMiddleSlide">
        <rdfs:label xml:lang="en">has stereo middle slide (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the stereo can be changed using the middle slide.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN887003-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasTouchscreen -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasTouchscreen">
        <rdfs:label xml:lang="en">has touchscreen (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the display is a touchscreen.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasTripodInterface -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasTripodInterface">
        <rdfs:label xml:lang="en">has tripod interface (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not a camera has a tripod interface. This interface is usually a hole which can be
↪    used by, e.g. a tripod, to connect the camera. By default, all tripods have such an interface. This interface is not used
↪    to transfer data, it is only used to physically connect both devices.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasTtlDirectMetering -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasTtlDirectMetering">
        <rdfs:label xml:lang="en">has ttl direct metering (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the flash supports TTL Direct Metering.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#hasVideoLight -->

    <owl:DatatypeProperty rdf:about="&cameraontology;hasVideoLight">
        <rdfs:label xml:lang="en">has video light (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the Camera or Flash has a Video Light.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN888002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#imageCapability -->

    <owl:DatatypeProperty rdf:about="&cameraontology;imageCapability">
        <rdfs:label xml:lang="en">image capability (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An image capability, in the form of: Codec_AspectRatio_Quality_Resolution:
E.g. JPEG_3:2_FF_6000X4000 or RAW_16:9_H_1920X1080

Known Codec values include: RAW,JPEG
Known Quality values include: FF (Full Frame), H (High), S (Standard)</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isActive -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isActive">
        <rdfs:label xml:lang="en">is active (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Describes if the file is active or not. I.e. is the file available?</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isBeta -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isBeta">
        <rdfs:label xml:lang="en">is beta (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Is the content file in beta status?</rdfs:comment>
        <rdfs:domain rdf:resource="&cameraontology;ContentFile"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isIp68Conform -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isIp68Conform">
        <rdfs:label xml:lang="en">is ip68 conform (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">What is an IP rating?

IP (or &quot;Ingress Protection&quot;) ratings are defined in international standard EN 60529 (British BS EN 60529:1992,
  ↪   European IEC 60509:1989). They are used to define levels of sealing effectiveness of electrical enclosures against
  ↪   intrusion from foreign bodies (tools, dirt etc) and moisture.

What do the numbers in an IP Rating mean?

The numbers that follow IP each have a specific meaning. The first indicates the degree of protection (of people) from moving
  ↪   parts, as well as the protection of enclosed equipment from foreign bodies. The second defines the protection level that
  ↪   the enclosure enjoys from various forms of moisture (drips, sprays, submersion etc). The tables below should help make
  ↪   sense of it:

First Digit (intrusion protection)

0 No special protection
1 Protection from a large part of the body such as a hand (but no protection from deliberate access); from solid objects greater
  ↪   than 50mm in diameter.
2 Protection against fingers or other object not greater than 80mm in length and 12mm in diameter.
3 Protection from entry by tools, wires etc, with a diameter of 2.5 mm or more.
4 Protection against solid bodies larger than 1mm (eg fine tools/small etc).
5 Protected against dust that may harm equipment.
6 Totally dust tight.

Second Digit (moisture protection)

0 No protection.
1 Protection against condensation.
2 Protection against water droplets deflected up to 15° from vertical
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3 Protected against spray up to 60° from vertical.
4 Protected against water spray from all directions.
5 Protection against low pressure water jets (all directions)
6 Protection against string water jets and waves.
7 Protected against temporary immersion.
8 Protected against prolonged effects of immersion under pressure.</rdfs:comment>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isLensLightEdition -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isLensLightEdition">
        <rdfs:label xml:lang="en">is lens light edition (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the lens is a &apos;light&apos; (weight) edition.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN891002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isMil810fConform -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isMil810fConform">
        <rdfs:label xml:lang="en">is mil810f conform (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">MIL-STD-810, Environmental Engineering Considerations and Laboratory Tests is a United
  ↪   States Military Standard that emphasizes tailoring an equipment&apos;s environmental design and test limits to the
  ↪   conditions that it will experience throughout its service life, and establishing chamber test methods that replicate the
  ↪   effects of environments on the equipment rather than imitating the environments themselves. The MIL-STD-810 test series
  ↪   are approved for use by all departments and agencies of the United States Department of Defense (DoD). Although prepared
  ↪   specifically for military applications, the standard is often used for commercial products as well.

The standard&apos;s guidance and test methods are intended to:

(i) Define environmental stress sequences, durations, and levels of equipment life cycles;
(ii) Be used to develop analysis and test criteria tailored to the equipment and its environmental life cycle;
(iii) Evaluate equipment&apos;s performance when exposed to a life cycle of environmental stresses;
(iv) Identify deficiencies, shortcomings, and defects in equipment design, materials, manufacturing processes, packaging
  ↪   techniques, and maintenance methods; and
(v) Demonstrate compliance with contractual requirements.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isTeleConverterCompatible -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isTeleConverterCompatible">
        <rdfs:label xml:lang="en">is tele converter compatible (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Whether or not the lens is compatible with a tele converter.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#isWideConverterCompatible -->

    <owl:DatatypeProperty rdf:about="&cameraontology;isWideConverterCompatible">
        <rdfs:label xml:lang="en">is wide converter compatible (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Whether or not the lens is compatible with a wide converter.</rdfs:comment>
```

```
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensApertureForm -->

    <owl:DatatypeProperty rdf:about="&cameraontology;lensApertureForm">
        <rdfs:label xml:lang="en">lens aperture form (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The form of the lens aperture, e.g. circular.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensCoating -->

    <owl:DatatypeProperty rdf:about="&cameraontology;lensCoating">
        <rdfs:label xml:lang="en">lens coating (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The type of lens coating. Currently, the values &apos;T*&apos;, &apos;Nano AR&apos;, and
↪   &apos;Multi Layered&apos; are supported.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensDispersionGlassType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;lensDispersionGlassType">
        <rdfs:label xml:lang="en">lens dispersion glass type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The type of dispersion glass used by the lens. Known values include: &apos;Extra Low&apos;,
↪   and &apos;Super Extra Low&apos;.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#lensElementsType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;lensElementsType">
```

```
        <rdfs:label xml:lang="en">lens elements type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The type of lens elements. Currently, we support the values: &apos;Asperical&apos;, and
  ↪    &apos;Advanced Aspherical&apos;.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
        <rdfs:domain>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&eco;C_AKN884002-gen"/>
                    <rdf:Description rdf:about="&eco;C_AKN891002-gen"/>
                </owl:unionOf>
            </owl:Class>
        </rdfs:domain>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#material -->

    <owl:DatatypeProperty rdf:about="&cameraontology;material">
        <rdfs:label xml:lang="en">material (1..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The material of which the bag or case is made.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN894002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#movieCapability -->

    <owl:DatatypeProperty rdf:about="&cameraontology;movieCapability">
        <rdfs:label xml:lang="en">movie capability (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Like &apos;image capability&apos; but in the form of:
  ↪    Codec_AspectRatio_Quality_Mode_Resolution:

Known values for mode include: 1080i, 1080p, 720p.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionLightSource -->

    <owl:DatatypeProperty rdf:about="&cameraontology;projectionLightSource">
        <rdfs:label xml:lang="en">projection light source (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Light Source of a projection, e.g. LED.

A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode, which emits light when
  ↪    activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within
  ↪    the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the
  ↪    light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor.

An LED is often small in area (less than 1 mm2) and integrated optical components may be used to shape its radiation
  ↪    pattern.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionResolution -->

    <owl:DatatypeProperty rdf:about="&cameraontology;projectionResolution">
        <rdfs:label xml:lang="en">projection resolution (0..*)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Supported projection resolution, in the form: widthXheight.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#projectionType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;projectionType">
        <rdfs:label xml:lang="en">projection type (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The Type of projection, e.g. DLP.

Digital Light Processing (DLP) is a display device based on micro-electro-mechanical technology that uses a digital micromirror
 ↪  device. It was originally developed in 1987 by Dr. Larry Hornbeck of Texas Instruments. While the DLP imaging device was
 ↪  invented by Texas Instruments, the first DLP-based projector was introduced by Digital Projection Ltd in 1997. Digital
 ↪  Projection and Texas Instruments were both awarded Emmy Awards in 1998 for the DLP projector technology. DLP is used in a
 ↪  variety of display applications from traditional static displays to interactive displays and also non-traditional
 ↪  embedded applications including medical, security, and industrial uses.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#retired -->

    <owl:DatatypeProperty rdf:about="&cameraontology;retired">
        <rdfs:label xml:lang="en">date retired (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The date on which the resource has retired.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&dc;date"/>
        <rdfs:subPropertyOf rdf:resource="&dcterms;date"/>
        <rdfs:range rdf:resource="&rdfs;Literal"/>
        <rdfs:domain rdf:resource="&owl;Thing"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#seriesName -->

    <owl:DatatypeProperty rdf:about="&cameraontology;seriesName">
        <rdfs:label xml:lang="en">series name (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The name of the series to which the product belongs.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#shortDescription -->

    <owl:DatatypeProperty rdf:about="&cameraontology;shortDescription">
        <rdfs:label xml:lang="en">short description (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">A short description for a product or service.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:domain rdf:resource="&gr;ProductOrService"/>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#usageType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;usageType">
        <rdfs:label xml:lang="en">usage type (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">The usage type of a bag or case, e.g. shoulder bag, backpack, etc.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN894002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewFinderResolution -->

    <owl:DatatypeProperty rdf:about="&cameraontology;viewFinderResolution">
        <rdfs:label xml:lang="en">viewfinder resolution (0..1)</rdfs:label>
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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The resolution of the viewfinder of a camera.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#viewfinderDisplayType -->

    <owl:DatatypeProperty rdf:about="&cameraontology;viewfinderDisplayType">
        <rdfs:label xml:lang="en">viewfinder display type (0..1)</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The display type of the viewfinder. Currently LCD and OLED are used.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN884002-gen"/>
        <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#zoomLever -->

    <owl:DatatypeProperty rdf:about="&cameraontology;zoomLever">
        <rdfs:label xml:lang="en">zoom lever (0..1)</rdfs:label>
        <rdfs:comment xml:lang="en">Is there a Zoom Lever on the device.</rdfs:comment>
        <rdfs:subPropertyOf rdf:resource="&gr;datatypeProductOrServiceProperty"/>
        <rdfs:domain rdf:resource="&eco;C_AKN889002-gen"/>
        <rdfs:range rdf:resource="&xsd;boolean"/>
    </owl:DatatypeProperty>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Classes
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->




    <!-- http://ogp.me/ns#Image -->

    <owl:Class rdf:about="&og;Image">
        <rdfs:label xml:lang="en">Image</rdfs:label>
        <owl:equivalentClass rdf:resource="&dctype;Image"/>
        <owl:equivalentClass rdf:resource="&s;ImageObject"/>
        <owl:equivalentClass rdf:resource="&foaf;Image"/>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Image of a certain Thing.</rdfs:comment>
    </owl:Class>



    <!-- http://ogp.me/ns#Video -->

    <owl:Class rdf:about="&og;Video">
        <rdfs:label xml:lang="en">Video</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;VideoObject"/>
        <rdfs:isDefinedBy>http://ogp.me/ns</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Video of a certain Thing.</rdfs:comment>
    </owl:Class>



    <!-- http://ogp.me/ns/product#QuantitativeValue -->

    <owl:Class rdf:about="&product;QuantitativeValue">
        <rdfs:label xml:lang="en">Quantitative value</rdfs:label>
        <owl:equivalentClass rdf:resource="&gr;QuantitativeValue"/>
        <owl:equivalentClass rdf:resource="&s;QuantitativeValue"/>
        <rdfs:comment xml:lang="en">A point value or interval for product characteristics and other purposes.</rdfs:comment>
        <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
    </owl:Class>
```

```
10570
    <!-- http://ogp.me/ns/product#pricespecification -->

    <owl:Class rdf:about="&product;pricespecification">
10575       <rdfs:label xml:lang="en">Price specification</rdfs:label>
            <owl:equivalentClass rdf:resource="&gr;PriceSpecification"/>
            <owl:equivalentClass rdf:resource="&s;PriceSpecification"/>
            <rdfs:comment xml:lang="en">A structured value representing a monetary amount.

10580 Info: This class is introduced by this ontology to group &amp;amp; match the price specification atributes with the GoodRelations
  ↪    ontology.</rdfs:comment>
            <rdfs:isDefinedBy>http://ogp.me/ns/product</rdfs:isDefinedBy>
    </owl:Class>


10585
    <!-- http://ogp.me/ns/website#WebSite -->

    <owl:Class rdf:about="&website;WebSite">
        <rdfs:label xml:lang="en">Web site</rdfs:label>
10590   <owl:equivalentClass rdf:resource="&s;WebSite"/>
        <rdfs:isDefinedBy>http://ogp.me/ns/website</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A WebSite is a set of related web pages and other items typically served from a single web
  ↪    domain and accessible via URLs.</rdfs:comment>
    </owl:Class>

10595

    <!-- http://purl.org/dc/dcmitype/Image -->

    <owl:Class rdf:about="&dctype;Image">
10600       <rdfs:label xml:lang="en">Image</rdfs:label>
            <owl:equivalentClass rdf:resource="&s;ImageObject"/>
            <owl:equivalentClass rdf:resource="&foaf;Image"/>
            <rdfs:comment xml:lang="en">Examples include images and photographs of physical objects, paintings, prints, drawings,
  ↪    other images and graphics, animations and moving pictures, film, diagrams, maps, musical notation. Note that Image may
  ↪    include both electronic and physical representations.</rdfs:comment>
            <rdfs:isDefinedBy>http://purl.org/dc/terms/DCMIType</rdfs:isDefinedBy>
10605   </owl:Class>



    <!-- http://purl.org/dc/terms/Agent -->
10610
    <owl:Class rdf:about="&dcterms;Agent">
        <owl:equivalentClass rdf:resource="&foaf;Agent"/>
        <rdfs:subClassOf rdf:resource="&dcterms;AgentClass"/>
    </owl:Class>
10615


    <!-- http://purl.org/dc/terms/AgentClass -->

10620   <owl:Class rdf:about="&dcterms;AgentClass">
            <rdfs:label xml:lang="en">Agent Class</rdfs:label>
            <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A group of agents.

10625 Examples of Agent Class include groups seen as classes, such as students, women, charities, lecturers.</rdfs:comment>
    </owl:Class>



10630   <!-- http://purl.org/dc/terms/FileFormat -->

    <owl:Class rdf:about="&dcterms;FileFormat">
        <rdfs:label xml:lang="en">File Format</rdfs:label>
        <rdfs:subClassOf rdf:resource="&dcterms;MediaType"/>
10635   <owl:disjointWith rdf:resource="&dcterms;PhysicalMedium"/>
        <rdfs:comment xml:lang="en">A digital resource format.

    Examples include the formats defined by the list of Internet Media Types.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
10640   </owl:Class>



    <!-- http://purl.org/dc/terms/LinguisticSystem -->
```

```
    <owl:Class rdf:about="&dcterms;LinguisticSystem">
        <rdfs:label xml:lang="en">Linguistic System</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;Language"/>
        <rdfs:comment xml:lang="en">A system of signs, symbols, sounds, gestures, or rules used in communication.

Examples include written, spoken, sign, and computer languages.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://purl.org/dc/terms/MediaType -->

    <owl:Class rdf:about="&dcterms;MediaType">
        <rdfs:label xml:lang="en">Media Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <owl:disjointWith rdf:resource="&dcterms;SizeOrDuration"/>
        <rdfs:comment xml:lang="en">A file format or physical medium.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/dc/terms/MediaTypeOrExtent -->

    <owl:Class rdf:about="&dcterms;MediaTypeOrExtent">
        <rdfs:label xml:lang="en">Media Type or Extent</rdfs:label>
        <rdfs:comment xml:lang="en">A media type or extent.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/dc/terms/PhysicalMedium -->

    <owl:Class rdf:about="&dcterms;PhysicalMedium">
        <rdfs:label xml:lang="en">Physical Medium</rdfs:label>
        <rdfs:subClassOf rdf:resource="&dcterms;MediaType"/>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A physical material or carrier.

Examples include paper, canvas, or DVD.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/dc/terms/SizeOrDuration -->

    <owl:Class rdf:about="&dcterms;SizeOrDuration">
        <rdfs:label xml:lang="en">Size or Duration</rdfs:label>
        <rdfs:subClassOf rdf:resource="&dcterms;MediaTypeOrExtent"/>
        <rdfs:comment xml:lang="en">A dimension or extent, or a time taken to play or execute.

Examples include a number of pages, a specification of length, width, and breadth, or a period in hours, minutes, and
  ↪    seconds.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#ActualProductOrServiceInstance -->

    <owl:Class rdf:about="&gr;ActualProductOrServiceInstance">
        <rdfs:label xml:lang="en">Actual product or service instance (DEPRECATED)</rdfs:label>
        <owl:equivalentClass rdf:resource="&gr;Individual"/>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <owl:deprecated rdf:datatype="&xsd;boolean">true</owl:deprecated>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">DEPRECATED - This class is superseded by gr:Individual. Replace all occurrences of
  ↪    gr:ActualProductOrServiceInstance by gr:Individual, if possible.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#Brand -->

    <owl:Class rdf:about="&gr;Brand">
        <rdfs:label xml:lang="en">Brand</rdfs:label>
```

```
        <owl:equivalentClass rdf:resource="&s;Brand"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;name"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;description"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A brand is the identity of a specific product, service, or business. Use foaf:logo for
  ↪   attaching a brand logo and gr:name or rdfs:label for attaching the brand name.

(Source: Wikipedia, the free encyclopedia, see http://en.wikipedia.org/wiki/Brand)</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://purl.org/goodrelations/v1#BusinessEntity -->

    <owl:Class rdf:about="&gr;BusinessEntity">
        <rdfs:label xml:lang="en">Business entity</rdfs:label>
        <owl:equivalentClass>
            <owl:Class>
                <owl:unionOf rdf:parseType="Collection">
                    <rdf:Description rdf:about="&s;Organization"/>
                    <rdf:Description rdf:about="&s;Person"/>
                </owl:unionOf>
            </owl:Class>
        </owl:equivalentClass>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;legalName"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;description"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;name"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An instance of this class represents the legal agent making (or seeking) a particular
  ↪   offering. This can be a legal body or a person. A business entity has at least a primary mailing address and contact
  ↪   details. For this, typical address standards (vCard) and location data (geo, WGS84) can be attached. Note that the
  ↪   location of the business entity is not necessarily the location from which the product or service is being available (e.g.
  ↪   the branch or store). Use gr:Location for stores and branches.

Example: Siemens Austria AG, Volkswagen Ltd., Peter Miller&amp;apos;s Cell phone Shop LLC

Compatibility with schema.org: This class is equivalent to the union of http://schema.org/Person and
  ↪   http://schema.org/Organization.</rdfs:comment>
    </owl:Class>


    <!-- http://purl.org/goodrelations/v1#Individual -->

    <owl:Class rdf:about="&gr;Individual">
        <rdfs:label xml:lang="en">Individual</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;IndividualProduct"/>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&s;Product"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isGrOwnedBy"/>
                <owl:onClass rdf:resource="&gr;BusinessEntity"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
```

```
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMakeAndModel"/>
                <owl:onClass rdf:resource="&gr;ProductOrServiceModel"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <owl:disjointWith rdf:resource="&gr;ProductOrServiceModel"/>
        <owl:disjointWith rdf:resource="&gr;SomeItems"/>
        <rdfs:comment xml:lang="en">A gr:Individual is an actual product or service instance, i.e., a single identifiable object
  ↪    or action that creates some increase in utility (in the economic sense) for the individual possessing or using this very
  ↪    object (product) or for the individual in whose favor this very action is being taken (service). Products or services are
  ↪    types of goods in the economic sense. For an overview of goods and commodities in economics, see Milgate (1987).

Examples: MyThinkpad T60, the pint of beer standing in front of me, my Volkswagen Golf, the haircut that I received or will be
  ↪    receiving at a given date and time.

Note 1: In many cases, product or service instances are not explicitly exposed on the Web but only claimed to exist (i.e.
  ↪    existentially quantified). In this case, use gr:SomeItems.
Note 2: This class is the new, shorter form of the former gr:ActualProductOrServiceInstance.

Compatibility with schema.org: This class is a subclass of http://schema.org/Product.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#Offering -->

    <owl:Class rdf:about="&gr;Offering">
        <rdfs:label xml:lang="en">Offering</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;condition"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isGrOfferedBy"/>
                <owl:onClass rdf:resource="&gr;BusinessEntity"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;name"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasEligibleQuantity"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;includes"/>
                <owl:onClass rdf:resource="&gr;ProductOrService"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;description"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">An offering represents the public, not necessarily binding, not necessarily exclusive,
  ↪    announcement by a gr:BusinessEntity to provide (or seek) a certain gr:BusinessFunction for a certain gr:ProductOrService
  ↪    to a specified target audience. An offering is specified by the type of product or service or bundle it refers to, what
  ↪    business function is being offered (sales, rental, ...), and a set of commercial properties. It can either refer to
(1) a clearly specified instance (gr:Individual),
(2) to a set of anonymous instances of a given type (gr:SomeItems),
(3) a product model specification (gr:ProductOrServiceModel), see also section 3.3.3 of the GoodRelations Technical Report.
```

```
An offering may be constrained in terms of the eligible type of business partner, countries, quantities, and other commercial
  ↪    properties. The definition of the commercial properties, the type of product offered, and the business function are
  ↪    explained in other parts of this vocabulary in more detail.

Example: Peter Miller offers to repair TV sets made by Siemens, Volkswagen Innsbruck sells a particular instance of a Volkswagen
  ↪    Golf at $10,000.

Compatibility with schema.org: This class is a superclass to http://schema.org/Offer, since gr:Offering can also represent
  ↪    demand.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#PriceSpecification -->

    <owl:Class rdf:about="&gr;PriceSpecification">
        <rdfs:label xml:lang="en">Price specification</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;PriceSpecification"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;valueAddedTaxIncluded"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMaxCurrencyValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasCurrency"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMinCurrencyValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasCurrencyValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasEligibleQuantity"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The superclass of all price specifications.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#ProductOrService -->

    <owl:Class rdf:about="&gr;ProductOrService">
        <rdfs:label xml:lang="en">Product or service</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;Product"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isIp68Conform"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
```

```
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;depth"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasManufacturer"/>
                <owl:onClass rdf:resource="&gr;BusinessEntity"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;seriesName"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;shortDescription"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;name"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;width"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;color"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;storageTemperature"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;condition"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;weight"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;alternativeName"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isMil810fConform"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
```

```
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;height"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;description"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;operatingTemperature"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The superclass of all classes describing products or services types, either by nature or
  ↪    purpose. Examples for such subclasses are &quot;TV set&quot;, &quot;vacuum cleaner&quot;, etc. An instance of this class
  ↪    can be either an actual product or service (gr:Individual), a placeholder instance for unknown instances of a
  ↪    mass-produced commodity (gr:SomeItems), or a model / prototype specification (gr:ProductOrServiceModel). When in doubt,
  ↪    use gr:SomeItems.

Examples:
a) MyCellphone123, i.e. my personal, tangible cell phone (gr:Individual)
b) Siemens1234, i.e. the Siemens cell phone make and model 1234 (gr:ProductOrServiceModel)
c) dummyCellPhone123 as a placeholder for actual instances of a certain kind of cell phones (gr:SomeItems)

Note: Your first choice for specializations of gr:ProductOrService should be http://www.productontology.org.

Compatibility with schema.org: This class is (approximately) equivalent to http://schema.org/Product.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#ProductOrServiceModel -->

    <owl:Class rdf:about="&gr;ProductOrServiceModel">
        <rdfs:label xml:lang="en">Product or service model</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;ProductModel"/>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;isVariantOf"/>
                <owl:onClass rdf:resource="&gr;ProductOrServiceModel"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <owl:disjointWith rdf:resource="&gr;SomeItems"/>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A product or service model is a intangible entity that specifies some characteristics of a
  ↪    group of similar, usually mass-produced products, in the sense of a prototype. In case of mass-produced products, there
  ↪    exists a relation gr:hasMakeAndModel between the actual product or service (gr:Individual or gr:SomeItems) and the
  ↪    prototype (gr:ProductOrServiceModel). GoodRelations treats product or service models as &quot;prototypes&quot; instead of
  ↪    a completely separate kind of entities, because this allows using the same domain-specific properties (e.g. gr:weight)
  ↪    for describing makes and models and for describing actual products.

Examples: Ford T, Volkswagen Golf, Sony Ericsson W123 cell phone

Note: An actual product or service (gr:Individual) by default shares the features of its model (e.g. the weight). However, this
  ↪    requires non-standard reasoning. See http://wiki.goodrelations-vocabulary.org/Axioms for respective rule sets.

Compatibility with schema.org: This class is (approximately) a subclass of http://schema.org/Product.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#ProductOrServicesSomeInstancesPlaceholder -->

    <owl:Class rdf:about="&gr;ProductOrServicesSomeInstancesPlaceholder">
        <rdfs:label xml:lang="en">Product or services some instances placeholder (DEPRECATED)</rdfs:label>
        <owl:equivalentClass rdf:resource="&gr;SomeItems"/>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
```

```
        <owl:deprecated rdf:datatype="&xsd;boolean">true</owl:deprecated>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">DEPRECATED - This class is superseded by gr:SomeItems. Replace all occurrences of
  ↪    gr:ProductOrServicesSomeInstancesPlaceholder by gr:SomeItems, if possible.</rdfs:comment>
    </owl:Class>


    <!-- http://purl.org/goodrelations/v1#QualitativeValue -->

    <owl:Class rdf:about="&gr;QualitativeValue">
        <rdfs:label xml:lang="en">Qualitative value</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;QualitativeValue"/>
        <rdfs:comment xml:lang="en">A qualitative value is a predefined value for a product characteristic.

Examples: the color &quot;green&quot; or the power cord plug type &quot;US&quot;; the garment sizes &quot;S&quot;,
  ↪    &quot;M&quot;, &quot;L&quot;, and &quot;XL&quot;.

Note: Value sets are supported by creating subclasses of this class. Ordinal relations between values (gr:greater, gr:lesser,
  ↪    ...) are provided directly by GoodRelations.

Compatibility with schema.org: This class is equivalent to http://schema.org/Enumeration.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://purl.org/goodrelations/v1#QuantitativeValue -->

    <owl:Class rdf:about="&gr;QuantitativeValue">
        <rdfs:label xml:lang="en">Quantitative value</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;QuantitativeValue"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMinValue"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasValue"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMaxValue"/>
                <owl:maxCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasUnitOfMeasurement"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A quantitative value is a numerical interval that represents the range of a certain
  ↪    gr:quantitativeProductOrServiceProperty in terms of the lower and upper bounds for a particular gr:ProductOrService. It
  ↪    is to be interpreted in combination with the respective unit of measurement. Most quantitative values are intervals even
  ↪    if they are in practice often treated as a single point value.

Example: a weight between 10 and 25 kilogramms, a length between 10 and 15 milimeters.

Compatibility with schema.org: This class is equivalent to http://schema.org/Quantity.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://purl.org/goodrelations/v1#QuantitativeValueFloat -->

    <owl:Class rdf:about="&gr;QuantitativeValueFloat">
        <rdfs:label xml:lang="en">Quantitative value float</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMaxValueFloat"/>
```

```
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMinValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <owl:disjointWith rdf:resource="&gr;QuantitativeValueInteger"/>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An instance of this class is an actual float value for a quantitative property of a product.
  ↪    This instance is usually characterized by a minimal value, a maximal value, and a unit of measurement.

Examples: The intervals &quot;between 10.0  and 25.4 kilogramms&quot; or &quot;10.2 and 15.5 milimeters&quot;.

Compatibility with schema.org: This class is a subclass of http://schema.org/Quantity.</rdfs:comment>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#QuantitativeValueInteger -->

    <owl:Class rdf:about="&gr;QuantitativeValueInteger">
        <rdfs:label xml:lang="en">Quantitative value integer</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QuantitativeValue"/>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMinValueInteger"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;int"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;int"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMaxValueInteger"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;int"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">An instance of this class is an actual integer value for a quantitative property of a
  ↪    product. This instance is usually characterized by a minimal value, a maximal value, and a unit of measurement.

Example: A seating capacity between 1 and 8 persons.

Note: Users must keep in mind that ranges in here mean that ALL possible values in this interval are covered. (Sometimes, the
  ↪    actual commitment may be less than that: &quot;We sell cars from 2 - 12 seats&quot; does often not really mean that they
  ↪    have cars with 2,3,4,...12 seats.). Someone renting out two types of rowing boats, one that fits for 1 or 2 people, and
  ↪    another that must be operated by 4 people cannot claim to rent boats with a seating capacity between 1 and 4 people. He
  ↪    or she is offering two boat types for 1-2 and 4 persons.

Compatibility with schema.org: This class is a subclass of http://schema.org/Quantity.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#SomeItems -->

    <owl:Class rdf:about="&gr;SomeItems">
        <rdfs:label xml:lang="en">Some items</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;SomeProducts"/>
```

```
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&s;Product"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasMakeAndModel"/>
                <owl:onClass rdf:resource="&gr;ProductOrServiceModel"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A placeholder instance for unknown instances of a mass-produced commodity. This is used as a
  ↪    computationally cheap work-around for such instances that are not individually exposed on the Web but just stated to
  ↪    exist (i.e., which are existentially quantified).

Example: An instance of this class can represent an anonymous set of green Siemens1234 phones. It is different from the
  ↪    gr:ProductOrServiceModel Siemens1234, since this refers to the make and model, and it is different from a particular
  ↪    instance of this make and model (e.g. my individual phone) since the latter can be sold only once.

Note: This class is the new, shorter form of the former gr:ProductOrServicesSomeInstancesPlaceholder.

Compatibility with schema.org: This class is (approximately) a subclass of http://schema.org/Product.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#TypeAndQuantityNode -->

    <owl:Class rdf:about="&gr;TypeAndQuantityNode">
        <rdfs:label xml:lang="en">Type and quantity node</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;TypeAndQuantityNode"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;typeOfGood"/>
                <owl:onClass>
                    <owl:Class>
                        <owl:unionOf rdf:parseType="Collection">
                            <rdf:Description rdf:about="&gr;Individual"/>
                            <rdf:Description rdf:about="&gr;SomeItems"/>
                        </owl:unionOf>
                    </owl:Class>
                </owl:onClass>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasUnitOfMeasurement"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;amountOfThisGood"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class collates all the information about a gr:ProductOrService included in a bundle. If
  ↪    a gr:Offering contains just one item, you can directly link from the gr:Offering to the gr:ProductOrService using
  ↪    gr:includes. If the offering contains multiple items, use an instance of this class for each component to indicate the
  ↪    quantity, unit of measurement, and type of product, and link from the gr:Offering via gr:includesObject.

Example: An offering may include of 100g of Butter and 1 kg of potatoes, or 1 cell phone and 2 headsets.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://purl.org/goodrelations/v1#UnitPriceSpecification -->

    <owl:Class rdf:about="&gr;UnitPriceSpecification">
        <rdfs:label xml:lang="en">Unit price specification</rdfs:label>
        <owl:equivalentClass rdf:resource="&s;UnitPriceSpecification"/>
        <rdfs:subClassOf rdf:resource="&gr;PriceSpecification"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;priceType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
```

```
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&gr;hasUnitOfMeasurement"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://purl.org/goodrelations/v1</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A unit price specification is a conceptual entity that specifies the price asked for a given gr:Offering by the respective gr:Business Entity. An offering may be linked to multiple unit price specifications that specify alternative prices for non-overlapping sets of conditions (e.g. quantities or sales regions) or with differing validity periods.

A unit price specification is characterized by (1) the lower and upper limits and the unit of measurement of the eligible quantity, (2) by a monetary amount per unit of the product or service, and (3)  whether this prices includes local sales taxes, namely VAT.

Example: The price, including VAT, for 1 kg of a given material is 5 Euros per kg for 0 - 5 kg and 4 Euros for quantities above 5 kg.

The eligible quantity interval for a given price is specified using the object property gr:hasEligibleQuantity, which points to an instance of gr:QuantitativeValue. The currency is specified using the gr:hasCurrency property, which points to an ISO 4217 currency code. The unit of measurement for the eligible quantity is specified using the gr:hasUnitOfMeasurement datatype property, which points to an UN/CEFACT Common Code (3 characters).

In most cases, the appropriate unit of measurement is the UN/CEFACT Common Code &amp;quot;C62&amp;quot; for &amp;quot;Unit or piece&amp;quot;, since a gr:Offering is defined by the quantity and unit of measurement of all items included (e.g. &amp;quot;1 kg of bananas plus a 2 kg of apples&amp;quot;). As long at the offering consists of only one item, it is also possible to use an unit of measurement of choice for specifying the price per unit. For bundles, however, only  &amp;quot;C62&amp;quot; for &amp;quot;Unit or piece&amp;quot; is a valid unit of measurement.

You can assume that the price is given per unit or piece if there is no gr:hasUnitOfMeasurement property attached to the price.

Whether VAT and sales taxes are included in this price is specified using the property gr:valueAddedTaxIncluded (xsd:boolean).

The price per unit of measurement is specified as a float value of the gr:hasCurrencyValue property. The currency is specified via the gr:hasCurrency datatype property. Whether the price includes VAT or not is indicated by the gr:valueAddedTaxIncluded datatype property.

The property priceType can be used to indicate that the price is a retail price recommendation only (i.e. a list price).

If the price can only be given as a range, use gr:hasMaxCurrencyValue and gr:hasMinCurrencyValue for the upper and lower bounds.

Important: When querying for the price, always use gr:hasMaxCurrencyValue and gr:hasMinCurrencyValue.

Note 1: Due to the complexity of pricing scenarios in various industries, it may be necessary to create extensions of this fundamental model of price specifications. Such can be done easily by importing and refining the GoodRelations ontology.

Note 2: For Google, attaching a gr:validThrough statement to a gr:UnitPriceSpecification is mandatory.</rdfs:comment>
    </owl:Class>


    <!-- http://schema.org/Action -->

    <owl:Class rdf:about="&s;Action">
        <rdfs:label xml:lang="en">Action</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/Action</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An action performed by a direct agent and indirect participants upon a direct object. Optionally happens at a location with the help of an inanimate instrument. The execution of the action may produce a result. Specific action sub-type documentation specifies the exact expectation of each argument/role.</rdfs:comment>
    </owl:Class>


    <!-- http://schema.org/AggregateOffer -->

    <owl:Class rdf:about="&s;AggregateOffer">
        <rdfs:label xml:lang="en">Aggregate offer</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Offer"/>
        <rdfs:comment xml:lang="en">When a single product is associated with multiple offers (for example, the same pair of shoes is offered by different merchants), then AggregateOffer can be used.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/AggregateOffer</rdfs:isDefinedBy>
    </owl:Class>
```

```
    <!-- http://schema.org/AggregateRating -->

    <owl:Class rdf:about="&s;AggregateRating">
        <rdfs:label xml:lang="en">Aggregate rating</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Rating"/>
        <rdfs:comment xml:lang="en">The average rating based on multiple ratings or reviews.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/AggregateRating</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/Brand -->

    <owl:Class rdf:about="&s;Brand">
        <rdfs:label xml:lang="en">Brand</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:isDefinedBy>http://schema.org/Brand</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A brand is a name used by an organization or business person for labeling a product, product
↪   group, or similar.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/ContactPage -->

    <owl:Class rdf:about="&s;ContactPage">
        <rdfs:label xml:lang="en">Contact page</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;WebPage"/>
        <rdfs:comment xml:lang="en">Web page type: Contact page.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/ContactPage</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/Corporation -->

    <owl:Class rdf:about="&s;Corporation">
        <rdfs:label xml:lang="en">Corporation</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Organization"/>
        <rdfs:isDefinedBy>http://schema.org/Corporation</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Organization: A business corporation.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/CreateAction -->

    <owl:Class rdf:about="&s;CreateAction">
        <rdfs:label xml:lang="en">Create action</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Action"/>
        <rdfs:comment xml:lang="en">The act of deliberately creating/producing/generating/building a result out of the
↪   agent.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/CreateAction</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/CreativeWork -->

    <owl:Class rdf:about="&s;CreativeWork">
        <rdfs:label xml:lang="en">Creative Work</rdfs:label>
        <owl:equivalentClass rdf:resource="&foaf;Document"/>
        <rdfs:comment xml:lang="en">The most generic kind of creative work, including books, movies, photographs, software
↪   programs, etc.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/CreativeWork</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/Distance -->

    <owl:Class rdf:about="&s;Distance">
        <rdfs:label xml:lang="en">Distance</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <owl:disjointWith rdf:resource="&s;Duration"/>
        <owl:disjointWith rdf:resource="&s;Energy"/>
        <owl:disjointWith rdf:resource="&s;Mass"/>
        <rdfs:comment xml:lang="en">Properties that take Distances as values are of the form &amp;apos;&amp;lt;Number&amp;gt; &amp;lt;Length
↪   unit of measure&amp;gt;&amp;apos;. E.g., &amp;apos;7 ft&amp;apos;.</rdfs:comment>
```

```
        <rdfs:isDefinedBy>http://schema.org/Distance</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://schema.org/Duration -->

    <owl:Class rdf:about="&s;Duration">
        <rdfs:label xml:lang="en">Duration</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <rdfs:isDefinedBy>http://schema.org/Duration</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Quantity: Duration (use  &lt;a href=&apos;http://en.wikipedia.org/wiki/ISO_8601&apos;&gt;ISO
    ↪   8601 duration format&lt;/a&gt;).</rdfs:comment>
    </owl:Class>

    <!-- http://schema.org/Energy -->

    <owl:Class rdf:about="&s;Energy">
        <rdfs:label xml:lang="en">Energy</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <rdfs:comment xml:lang="en">Properties that take Energy as values are of the form &apos;&lt;Number&gt; &lt;Energy unit
    ↪   of measure&gt;&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Energy</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://schema.org/Enumeration -->

    <owl:Class rdf:about="&s;Enumeration">
        <rdfs:label xml:lang="en">Enumeration</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:comment xml:lang="en">Lists or enumerations—for example, a list of cuisines or music genres, etc.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Enumeration</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://schema.org/ImageObject -->

    <owl:Class rdf:about="&s;ImageObject">
        <rdfs:label xml:lang="en">Image object</rdfs:label>
        <owl:equivalentClass rdf:resource="&foaf;Image"/>
        <rdfs:subClassOf rdf:resource="&s;MediaObject"/>
        <owl:disjointWith rdf:resource="&s;VideoObject"/>
        <rdfs:comment xml:lang="en">An image file.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/ImageObject</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://schema.org/IndividualProduct -->

    <owl:Class rdf:about="&s;IndividualProduct">
        <rdfs:label xml:lang="en">Individual Product</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Product"/>
        <rdfs:isDefinedBy>http://schema.org/IndividualProduct</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A single, identifiable product instance (e.g. a laptop with a particular serial
    ↪   number).</rdfs:comment>
    </owl:Class>

    <!-- http://schema.org/Intangible -->

    <owl:Class rdf:about="&s;Intangible">
        <rdfs:label xml:lang="en">Intangible</rdfs:label>
        <rdfs:isDefinedBy>http://schema.org/Intangible</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A utility class that serves as the umbrella for a number of &apos;intangible&apos; things
    ↪   such as quantities, structured values, etc.</rdfs:comment>
    </owl:Class>

    <!-- http://schema.org/Language -->

    <owl:Class rdf:about="&s;Language">
```

```
        <rdfs:label xml:lang="en">Language</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:comment xml:lang="en">Natural languages such as Spanish, Tamil, Hindi, English, etc. and programming languages such as Scheme and Lisp.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Language</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/Mass -->

    <owl:Class rdf:about="&s;Mass">
        <rdfs:label xml:lang="en">Mass</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Quantity"/>
        <rdfs:comment xml:lang="en">Properties that take Mass as values are of the form &amp;lt;Number&amp;gt; &amp;lt;Mass unit of measure&amp;gt;&amp;apos;. E.g., &amp;apos;7 kg&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Mass</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/MediaObject -->

    <owl:Class rdf:about="&s;MediaObject">
        <rdfs:label xml:lang="en">Media object</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;CreativeWork"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&s;contentUrl"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;anyURI"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;mediaHeight"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&s;contentSize"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&s;encodingFormat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;mediaWidth"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <owl:disjointWith rdf:resource="&s;WebPage"/>
        <owl:disjointWith rdf:resource="&s;WebSite"/>
        <rdfs:isDefinedBy>http://schema.org/MediaObject</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An image, video, or audio object embedded in a web page. Note that a creative work may have many media objects associated with it on the same web page. For example, a page about a single song (MusicRecording) may have a music video (VideoObject), and a high and low bandwidth audio stream (2 AudioObject&amp;apos;s).</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Offer -->

    <owl:Class rdf:about="&s;Offer">
        <rdfs:label xml:lang="en">Offer</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;Offering"/>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:isDefinedBy>http://schema.org/Offer</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">An offer to transfer some rights to an item or to provide a service—for example, an offer to
    ↪   sell tickets to an event, to rent the DVD of a movie, to stream a TV show over the internet, to repair a motorcycle, or
    ↪   to loan a book.
&lt;br/&gt;&lt;br/&gt;
      For &lt;a href=&quot;http://www.gs1.org/barcodes/technical/idkeys/gtin&quot;&gt;GTIN&lt;/a&gt;-related fields, see
      &lt;a href=&quot;http://www.gs1.org/barcodes/support/check_digit_calculator&quot;&gt;Check Digit calculator&lt;/a&gt;
      and &lt;a href=&quot;http://www.gs1us.org/resources/standards/gtin-validation-guide&quot;&gt;validation guide&lt;/a&gt;
      from &lt;a href=&quot;http://www.gs1.org/&quot;&gt;GS1&lt;/a&gt;.</rdfs:comment>
    </owl:Class>


    <!-- http://schema.org/Organization -->

    <owl:Class rdf:about="&s;Organization">
        <rdfs:label xml:lang="en">Organization</rdfs:label>
        <owl:equivalentClass rdf:resource="&foaf;Organization"/>
        <rdfs:subClassOf rdf:resource="&gr;BusinessEntity"/>
        <rdfs:isDefinedBy>http://schema.org/Organization</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An organization such as a school, NGO, corporation, club, etc.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Person -->

    <owl:Class rdf:about="&s;Person">
        <rdfs:label xml:lang="en">Person</rdfs:label>
        <owl:equivalentClass rdf:resource="&foaf;Person"/>
        <rdfs:subClassOf rdf:resource="&gr;BusinessEntity"/>
        <rdfs:comment xml:lang="en">A person (alive, dead, undead, or fictional).</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Person</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/PriceSpecification -->

    <owl:Class rdf:about="&s;PriceSpecification">
        <rdfs:label xml:lang="en">Price specification</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;StructuredValue"/>
        <owl:disjointWith rdf:resource="&s;QuantitativeValue"/>
        <owl:disjointWith rdf:resource="&s;TypeAndQuantityNode"/>
        <rdfs:isDefinedBy>http://schema.org/PriceSpecification</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A structured value representing a monetary amount. Typically, only the subclasses of this
    ↪   type are used for markup.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Product -->

    <owl:Class rdf:about="&s;Product">
        <rdfs:label xml:lang="en">Product</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&s;releaseDate"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;dateTime"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">Any offered product or service. For example: a pair of shoes; a concert ticket; the rental of
    ↪   a car; a haircut; or an episode of a TV show streamed online.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/ProductModel -->

    <owl:Class rdf:about="&s;ProductModel">
        <rdfs:label xml:lang="en">Product Model</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Product"/>
        <rdfs:isDefinedBy>http://schema.org/ProductModel</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A datasheet or vendor specification of a product (in the sense of a prototypical
    ↪   description).</rdfs:comment>
    </owl:Class>


```

```
    <!-- http://schema.org/QualitativeValue -->

    <owl:Class rdf:about="&s;QualitativeValue">
        <rdfs:label xml:lang="en">Qualitative value</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Enumeration"/>
        <rdfs:isDefinedBy>http://schema.org/QualitativeValue</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A predefined value for a product characteristic, e.g. the the power cord plug type
↪   &quot;US&quot; or the garment sizes &quot;S&quot;, &quot;M&quot;, &quot;L&quot;, and &quot;XL&quot;</rdfs:comment>
    </owl:Class>


    <!-- http://schema.org/QuantitativeValue -->

    <owl:Class rdf:about="&s;QuantitativeValue">
        <rdfs:label xml:lang="en">Quantitative value</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;StructuredValue"/>
        <owl:disjointWith rdf:resource="&s;TypeAndQuantityNode"/>
        <rdfs:isDefinedBy>http://schema.org/QuantitativeValue</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A point value or interval for product characteristics and other purposes.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Quantity -->

    <owl:Class rdf:about="&s;Quantity">
        <rdfs:label xml:lang="en">Quantity</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:isDefinedBy>http://schema.org/Quantity</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Quantities such as distance, time, mass, weight, etc. Particular instances of say Mass are
↪   entities like &apos;3 Kg&apos; or &apos;4 milligrams&apos;.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Rating -->

    <owl:Class rdf:about="&s;Rating">
        <rdfs:label xml:lang="en">Rating</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:isDefinedBy>http://schema.org/Rating</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The rating of the video.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/Review -->

    <owl:Class rdf:about="&s;Review">
        <rdfs:label xml:lang="en">Review</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;CreativeWork"/>
        <rdfs:comment xml:lang="en">A review of an item - for example, of a restaurant, movie, or store.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/Review</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/SomeProducts -->

    <owl:Class rdf:about="&s;SomeProducts">
        <rdfs:label xml:lang="en">Some Products</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Product"/>
        <rdfs:isDefinedBy>http://schema.org/SomeProducts</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A placeholder for multiple similar products of the same kind.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/StructuredValue -->

    <owl:Class rdf:about="&s;StructuredValue">
        <rdfs:label xml:lang="en">Structured value</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;Intangible"/>
        <rdfs:isDefinedBy>http://schema.org/StructuredValue</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Structured values are used when the value of a property has a more complex structure than
↪   simply being a textual value or a reference to another thing. Structured values are strings &amp;#x2014;for example,
↪   addresses&amp;#x2014;that have certain constraints on their structure.</rdfs:comment>
```

```
    </owl:Class>



    <!-- http://schema.org/TypeAndQuantityNode -->

    <owl:Class rdf:about="&s;TypeAndQuantityNode">
        <rdfs:label xml:lang="en">Type and quantity node</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;StructuredValue"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&s;amountOfThisGood"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;float"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A structured value indicating the quantity, unit of measurement, and business function of
↪   goods included in a bundle offer.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/TypeAndQuantityNode</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://schema.org/UnitPriceSpecification -->

    <owl:Class rdf:about="&s;UnitPriceSpecification">
        <rdfs:label xml:lang="en">Unit price specification</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;PriceSpecification"/>
        <rdfs:isDefinedBy>http://schema.org/UnitPriceSpecification</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The price asked for a given offer by the respective organization or person.</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/VideoObject -->

    <owl:Class rdf:about="&s;VideoObject">
        <rdfs:label xml:lang="en">Video object</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;MediaObject"/>
        <rdfs:comment xml:lang="en">A video file.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/VideoObject</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/WebPage -->

    <owl:Class rdf:about="&s;WebPage">
        <rdfs:label xml:lang="en">Web page</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;CreativeWork"/>
        <rdfs:isDefinedBy>http://schema.org/WebPage</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A web page. Every web page is implicitly assumed to be declared to be of type WebPage, so the
↪   various properties about that webpage, such as &lt;code&gt;breadcrumb&lt;/code&gt; may be used. We recommend explicit
↪   declaration if these properties are specified, but if they are found outside of an itemscope, they will be assumed to be
↪   about the page</rdfs:comment>
    </owl:Class>



    <!-- http://schema.org/WebSite -->

    <owl:Class rdf:about="&s;WebSite">
        <rdfs:label xml:lang="en">Web site</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;CreativeWork"/>
        <rdfs:comment xml:lang="en">A WebSite is a set of related web pages and other items typically served from a single web
↪   domain and accessible via URLs.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/WebSite</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://schema.org/WriteAction -->

    <owl:Class rdf:about="&s;WriteAction">
        <rdfs:label xml:lang="en">Write action</rdfs:label>
        <rdfs:subClassOf rdf:resource="&s;CreateAction"/>
        <rdfs:comment xml:lang="en">The act of authoring written creative content.</rdfs:comment>
        <rdfs:isDefinedBy>http://schema.org/WriteAction</rdfs:isDefinedBy>
    </owl:Class>
```

```
11815
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AdapterGeneric -->

11820   <owl:Class rdf:about="&cameraontology;AdapterGeneric">
            <rdfs:label xml:lang="en">Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
            <rdfs:subClassOf rdf:resource="&cameraontology;AdapterTaxonomy"/>
            <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
        ↪   specializations: Adapter (Photo camera, video camera).</rdfs:comment>
11825       <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:Class>


11830   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AdapterTaxonomy -->

        <owl:Class rdf:about="&cameraontology;AdapterTaxonomy">
            <rdfs:label xml:lang="en">Adapter (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance of
        ↪   this category in any context]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
11835       <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
        ↪   services in any relevant context: Adapter (Photo camera, video camera). It includes both related types of goods
        ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
        ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        </owl:Class>


11840
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AudioVideo -->

        <owl:Class rdf:about="&cameraontology;AudioVideo">
            <rdfs:label xml:lang="en">Audio/Video</rdfs:label>
11845       <rdfs:subClassOf rdf:resource="&cameraontology;PortType"/>
            <rdfs:comment xml:lang="en">An Audio Video Port in the form of: AV_Type{_Subtype}_In/Out{_Gender}, where {_Gender} and
        ↪   {_Subtype} are optional. Either In or Out needs to be specified to determine in- or output mode. On the side of the
        ↪   camera, The gender Female can be assumed if it is not specified.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:Class>

11850

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AutoCondition -->

        <owl:Class rdf:about="&cameraontology;AutoCondition">
11855       <rdfs:label xml:lang="en">Auto Condition</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
            <rdfs:comment xml:lang="en">An Automatic Condition Setting, in the form of: AC_Setting.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:Class>
11860

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BatteryGeneric -->

11865   <owl:Class rdf:about="&cameraontology;BatteryGeneric">
            <rdfs:label xml:lang="en">Battery (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
            <rdfs:subClassOf rdf:resource="&cameraontology;BatteryTaxonomy"/>
            <rdfs:subClassOf>
11870           <owl:Restriction>
                    <owl:onProperty rdf:resource="&eco;P_BAA564001"/>
                    <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                    <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                </owl:Restriction>
11875       </rdfs:subClassOf>
            <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;batteryTypeGender"/>
                    <owl:onClass rdf:resource="&cameraontology;Gender"/>
11880               <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:subClassOf>
                <owl:Restriction>
11885               <owl:onProperty rdf:resource="&cameraontology;batteryType"/>
                    <owl:onClass rdf:resource="&cameraontology;BatteryType"/>
```

```
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Battery (Photo camera, video camera).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BatteryTaxonomy -->

    <owl:Class rdf:about="&cameraontology;BatteryTaxonomy">
        <rdfs:label xml:lang="en">Battery (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance of
    ↪   this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Battery (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BatteryType -->

    <owl:Class rdf:about="&cameraontology;BatteryType">
        <rdfs:label xml:lang="en">Battery Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">The Battery Type of a product in the form of:

BT_BatteryType</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BracketMode -->

    <owl:Class rdf:about="&cameraontology;BracketMode">
        <rdfs:label xml:lang="en">Bracket Mode</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The most common type of autobracketing is exposure autobracketing (often abbreviated to AEB
    ↪   for Automatic Exposure Bracketing or BR for Bracketing), where the camera is set to capture the same image several times
    ↪   with different exposure settings, both over-exposed and under-exposed (lighter and darker) compared to the current setting
    ↪   on the camera,[1] which may already include exposure compensation. Depending on the camera, the difference between each
    ↪   of the autobracketed shots could be anywhere from one-quarter up to three full stops in each direction, in full, half,
    ↪   third or quarter stop increments, ranging from two up to nine shots in series. Sometimes it is possible to either define
    ↪   the order, in which the shots will be taken, or to give an offset as a start-point of the bracketing series. More
    ↪   sophisticated equipment allows auto-exposure bracketing to be combined with timer and intervalometer functions as well.

Cameras can perform autobracketing by adjusting either the shutter speed (typically in aperture priority mode, sometimes also in
    ↪   manual or program mode) or the aperture setting (typically in shutter priority mode). In programmed exposure mode, many
    ↪   cameras will alter both parameters at the same time. Some cameras allow to swap the parameter used for shifting in manual
    ↪   mode. Digital cameras may also alter the ISO setting if auto-ISO is enabled.

Exposure autobracketing is most commonly used with color reversal film (slide film) because of its small exposure latitude
    ↪   compared with print film (which has a wide exposure latitude) and digital cameras (which enable the photographer to
    ↪   review the captured image). In digital photography, autobracketing is convenient to shoot pictures for high dynamic range
    ↪   imaging.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Button -->

    <owl:Class rdf:about="&cameraontology;Button">
        <rdfs:label xml:lang="en">Button</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The buttons on a device.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CameraType -->
```

```
    <owl:Class rdf:about="&cameraontology;CameraType">
        <rdfs:label xml:lang="en">Camera Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">The Specific Type of a Camera, e.g. Reflex.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ColorSpaceSetting -->

    <owl:Class rdf:about="&cameraontology;ColorSpaceSetting">
        <rdfs:label xml:lang="en">Color Space Setting</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The color space setting, in the form of: CSS_Setting.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ContentFile -->

    <owl:Class rdf:about="&cameraontology;ContentFile">
        <rdfs:label xml:lang="en">Content File</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isBeta"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;fileVersion"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isActive"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;code"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A Content File represents any File that is available on some website and that is associated
↪   with some Product.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ContentSubType -->

    <owl:Class rdf:about="&cameraontology;ContentSubType">
        <rdfs:label xml:lang="en">Content Subtype</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;code"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isContentSubTypeOf"/>
                <owl:someValuesFrom rdf:resource="&cameraontology;ContentType"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A File belongs to a Content SubType, e.g. driver.</rdfs:comment>
    </owl:Class>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ContentType -->

    <owl:Class rdf:about="&cameraontology;ContentType">
        <rdfs:label xml:lang="en">Content Type</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;code"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasContentSubType"/>
                <owl:someValuesFrom rdf:resource="&cameraontology;ContentSubType"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A File belongs to a Content Type, e.g. download.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CreativeStyleColorMode -->

    <owl:Class rdf:about="&cameraontology;CreativeStyleColorMode">
        <rdfs:label xml:lang="en">Creative Style Color Mode</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Creative Style Color Mode, in the form of: CSCM_Setting.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Data -->

    <owl:Class rdf:about="&cameraontology;Data">
        <rdfs:label xml:lang="en">Data</rdfs:label>
        <rdfs:subClassOf rdf:resource="&cameraontology;PortType"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The data ports on a device, in the form of: D_Type{_Subtype}_In/Out{_Gender}, where {}
↪   denotes optional parts.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#EyeCupType -->

    <owl:Class rdf:about="&cameraontology;EyeCupType">
        <rdfs:label xml:lang="en">Eye-Cup Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Eye-Cup Type in the form of: ECT_EyeCupType.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FaceDetection -->

    <owl:Class rdf:about="&cameraontology;FaceDetection">
        <rdfs:label xml:lang="en">Face Detection</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Face Detection, in the form of: FD_Setting.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FaceDetectionFeature -->

    <owl:Class rdf:about="&cameraontology;FaceDetectionFeature">
        <rdfs:label xml:lang="en">Face Detection Feature</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">A Face Detection Feature, in the form of: FDF_Feature.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>
```

```
12105
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FilterAdapterGeneric -->

    <owl:Class rdf:about="&cameraontology;FilterAdapterGeneric">
12110       <rdfs:label xml:lang="en">Filter Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
            <rdfs:subClassOf rdf:resource="&cameraontology;FilterAdapterTaxonomy"/>
            <rdfs:subClassOf>
                <owl:Restriction>
12115               <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceLensThreadGender"/>
                    <owl:onClass rdf:resource="&cameraontology;Gender"/>
                    <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                </owl:Restriction>
            </rdfs:subClassOf>
12120       <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceLensThread"/>
                    <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                    <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
12125           </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThreadGender"/>
12130               <owl:onClass rdf:resource="&cameraontology;Gender"/>
                    <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:subClassOf>
12135           <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThread"/>
                    <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                    <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                </owl:Restriction>
12140       </rdfs:subClassOf>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
↪   specializations: Filter Adapter (Photo camera, video camera).</rdfs:comment>
    </owl:Class>

12145

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FilterAdapterTaxonomy -->

    <owl:Class rdf:about="&cameraontology;FilterAdapterTaxonomy">
12150       <rdfs:label xml:lang="en">Filter Adapter (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an
↪   instance of this category in any context]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&cameraontology;AdapterTaxonomy"/>
            <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
↪   services in any relevant context: Filter Adapter (Photo camera, video camera). It includes both related types of goods
↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
↪   (e.g. expenses reflecting such goods).</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>
12155


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FixedEyeLevelSystem -->

12160   <owl:Class rdf:about="&cameraontology;FixedEyeLevelSystem">
            <rdfs:label xml:lang="en">Fixed Eye-Level System</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
            <rdfs:comment xml:lang="en">Eye Level System of a Viewfinder.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12165   </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FixedFocusLensGeneric -->
12170
    <owl:Class rdf:about="&cameraontology;FixedFocusLensGeneric">
            <rdfs:label xml:lang="en">Fixed Focus Lens (Photo camera, video camera)  [Generic Concept: This type of
↪   goods]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
            <rdfs:subClassOf rdf:resource="&cameraontology;FixedFocusLensTaxonomy"/>
12175       <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
↪   specializations: Fixed Focus Lens (Photo camera, video camera).</rdfs:comment>
```

```
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FixedFocusLensTaxonomy -->

    <owl:Class rdf:about="&cameraontology;FixedFocusLensTaxonomy">
        <rdfs:label xml:lang="en">Fixed Focus Lens (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an
    ↪   instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Fixed Focus Lens (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FlashMode -->

    <owl:Class rdf:about="&cameraontology;FlashMode">
        <rdfs:label xml:lang="en">Flash Mode</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class describes different kinds of &amp;apos;Flash Mode&amp;apos;s.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Gender -->

    <owl:Class rdf:about="&cameraontology;Gender">
        <rdfs:label xml:lang="en">Gender</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Gender of an interface or part. Two instances are defined: G_Male and
    ↪   G_Female.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#GripType -->

    <owl:Class rdf:about="&cameraontology;GripType">
        <rdfs:label xml:lang="en">Grip Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">The Grip Type in the form of: GT_GripType.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IntelligentAutoRecognitionScene -->

    <owl:Class rdf:about="&cameraontology;IntelligentAutoRecognitionScene">
        <rdfs:label xml:lang="en">Intelligent Auto Recognition Scene</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An Intelligent Auto Recognition Scene setting, in the form of: IARS_Setting.</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensCapGeneric -->

    <owl:Class rdf:about="&cameraontology;LensCapGeneric">
        <rdfs:label xml:lang="en">Lens Cap (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;LensCapTaxonomy"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThreadGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
```

```
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThread"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Lens Cap (Photo camera, video camera).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensCapTaxonomy -->

    <owl:Class rdf:about="&cameraontology;LensCapTaxonomy">
        <rdfs:label xml:lang="en">Lens Cap (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance of
    ↪   this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Lens Cap (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensCorrection -->

    <owl:Class rdf:about="&cameraontology;LensCorrection">
        <rdfs:label xml:lang="en">Lens Correction</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">This class represents different lens correction modes. Form: LC_Mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensFocus -->

    <owl:Class rdf:about="&cameraontology;LensFocus">
        <rdfs:label xml:lang="en">Lens Focus</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">This class represents different lens focus modes. Form: LF_Mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensMeasure -->

    <owl:Class rdf:about="&cameraontology;LensMeasure">
        <rdfs:label xml:lang="en">Lens Measure</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">This class represents different lens measure modes. Form: LM_Mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensType -->

    <owl:Class rdf:about="&cameraontology;LensType">
        <rdfs:label xml:lang="en">Lens Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Type, in the form of: LT_Brand_Type.</rdfs:comment>
    </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LensZoom -->

    <owl:Class rdf:about="&cameraontology;LensZoom">
        <rdfs:label xml:lang="en">Lens Zoom</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">This class represents different lens zoom modes. Form: LZ_Mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

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    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MediumTelephotoLensGeneric -->

    <owl:Class rdf:about="&cameraontology;MediumTelephotoLensGeneric">
        <rdfs:label xml:lang="en">Medium Telephoto Lens (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;MediumTelephotoLensTaxonomy"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true specializations: Medium Telephoto Lens (Photo camera, video camera).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MediumTelephotoLensTaxonomy -->

    <owl:Class rdf:about="&cameraontology;MediumTelephotoLensTaxonomy">
        <rdfs:label xml:lang="en">Medium Telephoto Lens (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or services in any relevant context: Medium Telephoto Lens (Photo camera, video camera). It includes both related types of goods (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MediumType -->

    <owl:Class rdf:about="&cameraontology;MediumType">
        <rdfs:label xml:lang="en">Medium Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">A specific &amp;apos;Medium Type&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MemoryCardAdapterGeneric -->

    <owl:Class rdf:about="&cameraontology;MemoryCardAdapterGeneric">
       <rdfs:label xml:lang="en">Memory Card Adapter (Digital storage medium)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;MemoryCardAdapterTaxonomy"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hostInterfaceMemoryCardType"/>
                <owl:onClass rdf:resource="&cameraontology;MemoryCardType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;guestInterfaceMemoryCardType"/>
                <owl:onClass rdf:resource="&cameraontology;MemoryCardType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true specializations: Memory Card Adapter (Digital storage medium).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MemoryCardAdapterTaxonomy -->

    <owl:Class rdf:about="&cameraontology;MemoryCardAdapterTaxonomy">
        <rdfs:label xml:lang="en">Memory Card Adapter (Digital storage medium)  [Taxonomy Concept: Anything that may be an instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ624002-tax"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Memory Card Adapter (Digital storage medium). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
12395   </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MemoryCardGeneric -->
12400
    <owl:Class rdf:about="&cameraontology;MemoryCardGeneric">
        <rdfs:label xml:lang="en">Memory Card (Digital storage medium)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;MemoryCardTaxonomy"/>
12405   <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hostInterfaceMemoryCardType"/>
                <owl:onClass rdf:resource="&cameraontology;MemoryCardType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
12410       </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Memory Card (Digital storage medium).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>
12415


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MemoryCardTaxonomy -->

12420   <owl:Class rdf:about="&cameraontology;MemoryCardTaxonomy">
        <rdfs:label xml:lang="en">Memory Card (Digital storage medium)  [Taxonomy Concept: Anything that may be an instance of
    ↪   this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ624002-tax"/>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Memory Card (Digital storage medium). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12425   </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MemoryCardType -->
12430
    <owl:Class rdf:about="&cameraontology;MemoryCardType">
        <rdfs:label xml:lang="en">Memory Card Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&cameraontology;MediumType"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12435   <rdfs:comment xml:lang="en">Memory Card Type, in the form of: MCT_MemoryCardType{_MemoryCardGender}, where
    ↪   {_MemoryCardGender} is optional. Gender is only relevant in exceptional cases. If it is necessary to specify the gender,
    ↪   one can make the gender instances equal to the non gender instances.

In practice, the cards themselves are of gender Male and the interfaces are of gender Female.</rdfs:comment>
    </owl:Class>

12440


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Microphone -->

    <owl:Class rdf:about="&cameraontology;Microphone">
12445   <rdfs:label xml:lang="en">Microphone</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">Microphone functionality.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>
12450


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MountAdapterGeneric -->

12455   <owl:Class rdf:about="&cameraontology;MountAdapterGeneric">
        <rdfs:label xml:lang="en">Mount Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;MountAdapterTaxonomy"/>
        <rdfs:subClassOf>
12460       <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceMount"/>
                <owl:onClass rdf:resource="&cameraontology;MountType"/>
```

```
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceMountGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceMount"/>
                <owl:onClass rdf:resource="&cameraontology;MountType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceMountGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Mount Adapter (Photo camera, video camera).</rdfs:comment>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MountAdapterTaxonomy -->

    <owl:Class rdf:about="&cameraontology;MountAdapterTaxonomy">
        <rdfs:label xml:lang="en">Mount Adapter (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an
    ↪   instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&cameraontology;AdapterTaxonomy"/>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Mount Adapter (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MountType -->

    <owl:Class rdf:about="&cameraontology;MountType">
        <rdfs:label xml:lang="en">Mount Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">The Mount of a camera in the form of: MT_MountType.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#NormalLensGeneric -->

    <owl:Class rdf:about="&cameraontology;NormalLensGeneric">
        <rdfs:label xml:lang="en">Normal Lens (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;NormalLensTaxonomy"/>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Normal Lens (Photo camera, video camera).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#NormalLensTaxonomy -->

    <owl:Class rdf:about="&cameraontology;NormalLensTaxonomy">
        <rdfs:label xml:lang="en">Normal Lens (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance
    ↪   of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

```
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Normal Lens (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#OpticalDiscType -->

    <owl:Class rdf:about="&cameraontology;OpticalDiscType">
        <rdfs:label xml:lang="en">Optical Disc Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&cameraontology;MediumType"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The class describing diffent instances of an &apos;Optical Disc&apos;.</rdfs:comment>
    </owl:Class>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PhotoCreativitySetting -->

    <owl:Class rdf:about="&cameraontology;PhotoCreativitySetting">
        <rdfs:label xml:lang="en">Photo Creativity Setting</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Photo Creativity Setting, in the form of: PCS_Setting.</rdfs:comment>
    </owl:Class>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PictureEffect -->

    <owl:Class rdf:about="&cameraontology;PictureEffect">
        <rdfs:label xml:lang="en">Picture Effect</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">A Picture Effect, in the form of: PE_Setting.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PortType -->

    <owl:Class rdf:about="&cameraontology;PortType">
        <rdfs:label xml:lang="en">Port Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Port Type of a camera.</rdfs:comment>
    </owl:Class>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ProductCategory -->

    <owl:Class rdf:about="&cameraontology;ProductCategory">
        <rdfs:label xml:lang="en">Product Category</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasProductSubCategory"/>
                <owl:someValuesFrom rdf:resource="&cameraontology;ProductSubCategory"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isProductCategoryOf"/>
                <owl:someValuesFrom rdf:resource="&cameraontology;ProductType"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;code"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">A Product belongs to a certain Category.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>
```

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12610
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ProductSeries -->

        <owl:Class rdf:about="&cameraontology;ProductSeries">
            <rdfs:label xml:lang="en">Product Series</rdfs:label>
12615       <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;code"/>
                    <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                    <owl:onDataRange rdf:resource="&xsd;string"/>
12620           </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;isProductSeriesOf"/>
12625               <owl:someValuesFrom rdf:resource="&cameraontology;ProductSubCategory"/>
                </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:comment xml:lang="en">A product belongs to a certain Product Serie.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12630   </owl:Class>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ProductSubCategory -->
12635
        <owl:Class rdf:about="&cameraontology;ProductSubCategory">
            <rdfs:label xml:lang="en">Product Subcategory</rdfs:label>
            <rdfs:subClassOf>
                <owl:Restriction>
12640               <owl:onProperty rdf:resource="&cameraontology;code"/>
                    <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                    <owl:onDataRange rdf:resource="&xsd;string"/>
                </owl:Restriction>
            </rdfs:subClassOf>
12645       <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;isProductSubCategoryOf"/>
                    <owl:someValuesFrom rdf:resource="&cameraontology;ProductCategory"/>
                </owl:Restriction>
12650       </rdfs:subClassOf>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">A Product belongs to a Product Subcategory.</rdfs:comment>
        </owl:Class>

12655

        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ProductType -->

        <owl:Class rdf:about="&cameraontology;ProductType">
12660       <rdfs:label xml:lang="en">Product Type</rdfs:label>
            <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;hasProductCategory"/>
                    <owl:someValuesFrom rdf:resource="&cameraontology;ProductCategory"/>
12665           </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:subClassOf>
                <owl:Restriction>
                    <owl:onProperty rdf:resource="&cameraontology;code"/>
12670               <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
                    <owl:onDataRange rdf:resource="&xsd;string"/>
                </owl:Restriction>
            </rdfs:subClassOf>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12675       <rdfs:comment xml:lang="en">A Product is categorized in a certain Product Type.</rdfs:comment>
        </owl:Class>



12680   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SceneSelection -->

        <owl:Class rdf:about="&cameraontology;SceneSelection">
            <rdfs:label xml:lang="en">Scene Selection</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
12685       <rdfs:comment xml:lang="en">A Scene Selection setting, in the form of: SS_Setting.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:Class>
```

```
12690
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SensorFormat -->

    <owl:Class rdf:about="&cameraontology;SensorFormat">
        <rdfs:label xml:lang="en">Sensor Format</rdfs:label>
12695   <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format of a camera in the form of SF_A/B
where A and B are numbers or in the form of SF_A where A is a String.</rdfs:comment>
    </owl:Class>
12700


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ShoeAdapterGeneric -->

12705   <owl:Class rdf:about="&cameraontology;ShoeAdapterGeneric">
        <rdfs:label xml:lang="en">Shoe Adapter (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;ShoeAdapterTaxonomy"/>
        <rdfs:subClassOf>
12710       <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceShoe"/>
                <owl:onClass rdf:resource="&cameraontology;ShoeType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
12715   </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceShoeGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
12720           <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
12725           <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceShoeGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
12730   <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceShoe"/>
                <owl:onClass rdf:resource="&cameraontology;ShoeType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
12735       </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
  ↪   specializations: Shoe Adapter (Photo camera, video camera).</rdfs:comment>
    </owl:Class>
12740


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ShoeAdapterTaxonomy -->

12745   <owl:Class rdf:about="&cameraontology;ShoeAdapterTaxonomy">
        <rdfs:label xml:lang="en">Shoe Adapter (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an instance
  ↪   of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&cameraontology;AdapterTaxonomy"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
  ↪   services in any relevant context: Shoe Adapter (Photo camera, video camera). It includes both related types of goods
  ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
  ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
12750   </owl:Class>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ShoeType -->
12755
    <owl:Class rdf:about="&cameraontology;ShoeType">
        <rdfs:label xml:lang="en">Shoe Type</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
12760   <rdfs:comment xml:lang="en">The interface shoe type of the camera. Instances are of the form: ST_ShoeType.</rdfs:comment>
    </owl:Class>
```

```
12765       <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SmileShutter -->

            <owl:Class rdf:about="&cameraontology;SmileShutter">
                <rdfs:label xml:lang="en">Smile Shutter</rdfs:label>
                <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
12770           <rdfs:comment xml:lang="en">A Smile Shutter setting, in the form of: SS_Setting.</rdfs:comment>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            </owl:Class>


12775
            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Speaker -->

            <owl:Class rdf:about="&cameraontology;Speaker">
                <rdfs:label xml:lang="en">Speaker</rdfs:label>
12780           <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">Speaker functionality.</rdfs:comment>
            </owl:Class>

12785


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SteadyShot -->

            <owl:Class rdf:about="&cameraontology;SteadyShot">
12790           <rdfs:label xml:lang="en">SteadyShot</rdfs:label>
                <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">The integrated image stabilisation technologies used in Sony video camcorders, DSLR cameras
            ↪   and on Sony Xperia smartphones and tablets. Different versions of these technologies are known as Super SteadyShot (SSS),
            ↪   SteadyShot INSIDE (SSI) and Optical SteadyShot (OSS) in Sonys Cyber-shot and Alpha product families.</rdfs:comment>
            </owl:Class>
12795


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Switch -->

12800       <owl:Class rdf:about="&cameraontology;Switch">
                <rdfs:label xml:lang="en">Switch</rdfs:label>
                <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">A Device can have multiple switches.</rdfs:comment>
12805       </owl:Class>



            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#TelephotoLensGeneric -->
12810
            <owl:Class rdf:about="&cameraontology;TelephotoLensGeneric">
               <rdfs:label xml:lang="en">Telephoto Lens (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
                <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
                <rdfs:subClassOf rdf:resource="&cameraontology;TelephotoLensTaxonomy"/>
12815           <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
            ↪   specializations: Telephoto Lens (Photo camera, video camera).</rdfs:comment>
            </owl:Class>


12820
            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#TelephotoLensTaxonomy -->

            <owl:Class rdf:about="&cameraontology;TelephotoLensTaxonomy">
                <rdfs:label xml:lang="en">Telephoto Lens (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an
            ↪   instance of this category in any context]</rdfs:label>
12825           <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
                <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
            ↪   services in any relevant context: Telephoto Lens (Photo camera, video camera). It includes both related types of goods
            ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
            ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            </owl:Class>

12830


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WhiteBalance -->
```

```
    <owl:Class rdf:about="&cameraontology;WhiteBalance">
        <rdfs:label xml:lang="en">White Balance</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;QualitativeValue"/>
        <rdfs:comment xml:lang="en">The White Balance options of a camera.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WideAngleLensGeneric -->

    <owl:Class rdf:about="&cameraontology;WideAngleLensGeneric">
       <rdfs:label xml:lang="en">Wide Angle Lens (Photo camera, video camera)  [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&cameraontology;WideAngleLensTaxonomy"/>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Wide Angle Lens (Photo camera, video camera).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WideAngleLensTaxonomy -->

    <owl:Class rdf:about="&cameraontology;WideAngleLensTaxonomy">
        <rdfs:label xml:lang="en">Wide Angle Lens (Photo camera, video camera)  [Taxonomy Concept: Anything that may be an
    ↪   instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Wide Angle Lens (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB283003-tax -->

    <owl:Class rdf:about="&eco;C_AAB283003-tax">
        <rdfs:label xml:lang="en">Reprotechnics 19090000 [Taxonomy Concept: Anything that may be an instance of this category in
    ↪   any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ313002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19090000</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Reprotechnics. It includes both related types of goods (e.g.accessories, supplies,...)
    ↪   and items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
    ↪   goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB291003-tax -->

    <owl:Class rdf:about="&eco;C_AAB291003-tax">
        <rdfs:label xml:lang="en">Optical equipment (discontinued) 19090500 [Taxonomy Concept: Anything that may be an instance
    ↪   of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AAB283003-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19090500</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Optical equipment (discontinued). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB292005-gen -->

    <owl:Class rdf:about="&eco;C_AAB292005-gen">
        <rdfs:label xml:lang="en">Photo-camera, camera (discontinued) [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AAB292005-tax"/>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Photo-camera, camera (discontinued).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>
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12900
        <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB292005-tax -->

        <owl:Class rdf:about="&eco;C_AAB292005-tax">
12905       <rdfs:label xml:lang="en">Photo-camera, camera (discontinued) 19090501 [Taxonomy Concept: Anything that may be an
          ↪   instance of this category in any context]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&eco;C_AAB291003-tax"/>
            <eco:hierarchyCode rdf:datatype="&xsd;integer">19090501</eco:hierarchyCode>
            <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
          ↪   services in any relevant context: Photo-camera, camera (discontinued). It includes both related types of goods
          ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
          ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
            <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
12910   </owl:Class>



        <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB293003-gen -->
12915
        <owl:Class rdf:about="&eco;C_AAB293003-gen">
            <rdfs:label xml:lang="en">Camera (accessories) (discontinued) [Generic Concept: This type of goods]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
            <rdfs:subClassOf rdf:resource="&eco;C_AAB293003-tax"/>
12920       <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
          ↪   specializations: Camera (accessories) (discontinued).</rdfs:comment>
            <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        </owl:Class>


12925
        <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AAB293003-tax -->

        <owl:Class rdf:about="&eco;C_AAB293003-tax">
            <rdfs:label xml:lang="en">Camera (accessories) (discontinued) 19090502 [Taxonomy Concept: Anything that may be an
          ↪   instance of this category in any context]</rdfs:label>
12930       <rdfs:subClassOf rdf:resource="&eco;C_AAB291003-tax"/>
            <eco:hierarchyCode rdf:datatype="&xsd;integer">19090502</eco:hierarchyCode>
            <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
          ↪   services in any relevant context: Camera (accessories) (discontinued). It includes both related types of goods
          ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
          ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        </owl:Class>
12935


        <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ313002-tax -->

12940   <owl:Class rdf:about="&eco;C_AKJ313002-tax">
            <rdfs:label xml:lang="en">Information, communication and media technology 19000000 [Taxonomy Concept: Anything that may
          ↪   be an instance of this category in any context]</rdfs:label>
            <eco:hierarchyCode rdf:datatype="&xsd;integer">19000000</eco:hierarchyCode>
            <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
          ↪   services in any relevant context: Information, communication and media technology. It includes both related types of
          ↪   goods (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective
          ↪   category (e.g. expenses reflecting such goods).</rdfs:comment>
            <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
12945   </owl:Class>



        <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ563002-tax -->
12950
        <owl:Class rdf:about="&eco;C_AKJ563002-tax">
            <rdfs:label xml:lang="en">Entertainment electronics 19080000 [Taxonomy Concept: Anything that may be an instance of this
          ↪   category in any context]</rdfs:label>
            <rdfs:subClassOf rdf:resource="&eco;C_AKJ313002-tax"/>
            <eco:hierarchyCode rdf:datatype="&xsd;integer">19080000</eco:hierarchyCode>
12955       <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
          ↪   services in any relevant context: Entertainment electronics. It includes both related types of goods (e.g.accessories,
          ↪   supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses
          ↪   reflecting such goods).</rdfs:comment>
            <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        </owl:Class>


12960
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    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ608002-gen -->

    <owl:Class rdf:about="&eco;C_AKJ608002-gen">
        <rdfs:label xml:lang="en">TV/video/DVD device [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ608002-tax"/>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: TV/video/DVD device.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ608002-tax -->

    <owl:Class rdf:about="&eco;C_AKJ608002-tax">
        <rdfs:label xml:lang="en">TV/video/DVD device 19080500 [Taxonomy Concept: Anything that may be an instance of this
    ↪   category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ563002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19080500</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: TV/video/DVD device. It includes both related types of goods (e.g.accessories,
    ↪   supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses
    ↪   reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ609002-gen -->

    <owl:Class rdf:about="&eco;C_AKJ609002-gen">
        <rdfs:label xml:lang="en">TV device [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ609002-tax"/>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: TV device.</rdfs:comment>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ609002-tax -->

    <owl:Class rdf:about="&eco;C_AKJ609002-tax">
        <rdfs:label xml:lang="en">TV device 19080501 [Taxonomy Concept: Anything that may be an instance of this category in any
    ↪   context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ608002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19080501</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: TV device. It includes both related types of goods (e.g.accessories, supplies,...) and
    ↪   items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
    ↪   goods).</rdfs:comment>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ622002-tax -->

    <owl:Class rdf:about="&eco;C_AKJ622002-tax">
        <rdfs:label xml:lang="en">Audio/video storage medium 19080600 [Taxonomy Concept: Anything that may be an instance of
    ↪   this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ563002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19080600</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Audio/video storage medium. It includes both related types of goods (e.g.accessories,
    ↪   supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses
    ↪   reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ624002-gen -->

    <owl:Class rdf:about="&eco;C_AKJ624002-gen">
        <rdfs:label xml:lang="en">Digital storage medium [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
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        <rdfs:subClassOf rdf:resource="&eco;C_AKJ624002-tax"/>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Digital storage medium.</rdfs:comment>
    </owl:Class>

    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKJ624002-tax -->

    <owl:Class rdf:about="&eco;C_AKJ624002-tax">
        <rdfs:label xml:lang="en">Digital storage medium 19080602 [Taxonomy Concept: Anything that may be an instance of this
    ↪   category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ622002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19080602</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Digital storage medium. It includes both related types of goods (e.g.accessories,
    ↪   supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses
    ↪   reflecting such goods).</rdfs:comment>
    </owl:Class>

    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN883002-tax -->

    <owl:Class rdf:about="&eco;C_AKN883002-tax">
        <rdfs:label xml:lang="en">Photo technology, video technology 19100000 [Taxonomy Concept: Anything that may be an
    ↪   instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKJ313002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100000</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Photo technology, video technology. It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>

    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN884002-gen -->

    <owl:Class rdf:about="&eco;C_AKN884002-gen">
        <rdfs:label xml:lang="en">Photo camera, video camera [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN884002-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;batteryInterfaceType"/>
                <owl:onClass rdf:resource="&cameraontology;BatteryType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;digitalZoom"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;viewFinderResolution"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&eco;P_BAG977001"/>
                <owl:onClass rdf:resource="&cameraontology;CameraType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;bulb"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasElectronicViewFinder"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasTtlDirectMetering"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;projectionContinuousTime"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasGps"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isWideConverterCompatible"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasMobilePhoneDisplayConnection"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;projectionThrowDistanceRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
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13445           <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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13465           <owl:onClass rdf:resource="&cameraontology;MountType"/>
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                <owl:onProperty rdf:resource="&cameraontology;hasBuildInFlash"/>
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                <owl:onDataRange rdf:resource="&xsd;boolean"/>
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                <owl:onProperty rdf:resource="&cameraontology;flashCompensationRange"/>
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                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasNetworkWlan"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
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                <owl:onProperty rdf:resource="&cameraontology;lensType"/>
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            </owl:Restriction>
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        <rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceShoe"/>
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        </rdfs:subClassOf>
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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
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                <owl:onProperty rdf:resource="&cameraontology;batteryInterfaceTypeGender"/>
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        </rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;lensDispersionGlassType"/>
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            </owl:Restriction>
        </rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;minimumFocusDistance"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
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        </rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;lensApertureWide"/>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;palAutoMode"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;lensGroups"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;lensElements"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
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            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;ntscAutoMode"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;viewFinderPowerConsumptionNormalBrightnessMp4"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
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            <owl:Restriction>
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        </rdfs:subClassOf>
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            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;viewfinderDisplayType"/>
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                <owl:onDataRange rdf:resource="&xsd;string"/>
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        </rdfs:subClassOf>
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            <owl:Restriction>
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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
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                <owl:onProperty rdf:resource="&cameraontology;flashSyncSpeed"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;usbVoltage"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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        </rdfs:subClassOf>
        <rdfs:subClassOf>
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                <owl:onProperty rdf:resource="&cameraontology;focalLengthPhotoWide"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;batteryLife"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
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        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;continuousFlashTotal"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;speaker"/>
                <owl:onClass rdf:resource="&cameraontology;Speaker"/>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;projectionContrastRatio"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightness4k"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensApertureForm"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;maximumBurstLength"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;clearImageZoom"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;viewFinderEyePointFromFrame"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashGuideNumber"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lcdPowerConsumptionNormalBrightnessSdHdd"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;projectionType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
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                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasManualProjectionFocus"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashTeleRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
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            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;extendedZoom"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraDcInVoltage"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
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        </rdfs:subClassOf>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Photo camera, video camera.</rdfs:comment>
    </owl:Class>

    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN884002-tax -->

    <owl:Class rdf:about="&eco;C_AKN884002-tax">
        <rdfs:label xml:lang="en">Photo camera, video camera 19100100 [Taxonomy Concept: Anything that may be an instance of
    ↪   this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN883002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100100</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Photo camera, video camera. It includes both related types of goods (e.g.accessories,
    ↪   supplies,...) and items that are no actual goods of this kind but related to the respective category (e.g. expenses
    ↪   reflecting such goods).</rdfs:comment>
    </owl:Class>

    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN887003-gen -->

    <owl:Class rdf:about="&eco;C_AKN887003-gen">
        <rdfs:label xml:lang="en">Photo camera, video camera (accessories) [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasStereoMiddleSlide"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;microphone"/>
                <owl:onClass rdf:resource="&cameraontology;Microphone"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;gripType"/>
                <owl:onClass rdf:resource="&cameraontology;GripType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;gripTypeGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;eyeCupType"/>
                <owl:onClass rdf:resource="&cameraontology;EyeCupType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;directionalAngleRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;eyeCupTypeGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
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        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
  ↪    specializations: Photo camera, video camera (accessories).

In the Camera Ontology, we intent to use it to represent accessories that we do not want to categorise/subdivide any further,
  ↪    e.g. wristband.</rdfs:comment>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN887003-tax -->

    <owl:Class rdf:about="&eco;C_AKN887003-tax">
        <rdfs:label xml:lang="en">Photo camera, video camera (accessories) 19100200 [Taxonomy Concept: Anything that may be an
  ↪    instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN883002-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100200</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
  ↪    services in any relevant context: Photo camera, video camera (accessories). It includes both related types of goods
  ↪    (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
  ↪    (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN888002-gen -->

    <owl:Class rdf:about="&eco;C_AKN888002-gen">
        <rdfs:label xml:lang="en">Flash device [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN888002-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceShoeGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;powerRequirement"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashGuideNumber"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashWideRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasTtlDirectMetering"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashCompensationStep"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceShoe"/>
                <owl:onClass rdf:resource="&cameraontology;ShoeType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashRecyclingTime"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasVideoLight"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashCoverage"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashTeleRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasPreFlashControl"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;continuousFlashTotal"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;continuousFlash"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;flashCompensationRange"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Flash device.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN888002-tax -->

    <owl:Class rdf:about="&eco;C_AKN888002-tax">
        <rdfs:label xml:lang="en">Flash device 19100201 [Taxonomy Concept: Anything that may be an instance of this category in
    ↪   any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100201</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Flash device. It includes both related types of goods (e.g.accessories, supplies,...)
    ↪   and items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
    ↪   goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>
```

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    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN889002-gen -->

    <owl:Class rdf:about="&eco;C_AKN889002-gen">
        <rdfs:label xml:lang="en">Tripod [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN889002-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;tiltingAngleDown"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;elevatorStroke"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;maximumSupportedWeight"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;tiltingAngleUp"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;stages"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasCameraInterface"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;panningAngle"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;panHandleLength"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cableLength"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Tripod.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN889002-tax -->
```

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  <owl:Class rdf:about="&eco;C_AKN889002-tax">
      <rdfs:label xml:lang="en">Tripod 19100202 [Taxonomy Concept: Anything that may be an instance of this category in any
↪   context]</rdfs:label>
      <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
      <eco:hierarchyCode rdf:datatype="&xsd;integer">19100202</eco:hierarchyCode>
      <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
      <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
↪   services in any relevant context: Tripod. It includes both related types of goods (e.g.accessories, supplies,...) and
↪   items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
↪   goods).</rdfs:comment>
  </owl:Class>



  <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN890002-gen -->

  <owl:Class rdf:about="&eco;C_AKN890002-gen">
      <rdfs:label xml:lang="en">Lighting [Generic Concept: This type of goods]</rdfs:label>
      <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
      <rdfs:subClassOf rdf:resource="&eco;C_AKN890002-tax"/>
      <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
      <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
↪   specializations: Lighting.</rdfs:comment>
  </owl:Class>


  <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN890002-tax -->

  <owl:Class rdf:about="&eco;C_AKN890002-tax">
      <rdfs:label xml:lang="en">Lighting 19100203 [Taxonomy Concept: Anything that may be an instance of this category in any
↪   context]</rdfs:label>
      <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
      <eco:hierarchyCode rdf:datatype="&xsd;integer">19100203</eco:hierarchyCode>
      <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
↪   services in any relevant context: Lighting. It includes both related types of goods (e.g.accessories, supplies,...) and
↪   items that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
↪   goods).</rdfs:comment>
      <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
  </owl:Class>



  <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN891002-gen -->

  <owl:Class rdf:about="&eco;C_AKN891002-gen">
      <rdfs:label xml:lang="en">Lens [Generic Concept: This type of goods]</rdfs:label>
      <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
      <rdfs:subClassOf rdf:resource="&eco;C_AKN891002-tax"/>
      <rdfs:subClassOf>
          <owl:Restriction>
              <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceMountGender"/>
              <owl:onClass rdf:resource="&cameraontology;Gender"/>
              <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
          </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
          <owl:Restriction>
              <owl:onProperty rdf:resource="&cameraontology;lensGroups"/>
              <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
              <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
          </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
          <owl:Restriction>
              <owl:onProperty rdf:resource="&cameraontology;lensCoating"/>
              <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
              <owl:onDataRange rdf:resource="&xsd;string"/>
          </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
          <owl:Restriction>
              <owl:onProperty rdf:resource="&cameraontology;focalLength"/>
              <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
              <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
          </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
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            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isTeleConverterCompatible"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isWideConverterCompatible"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;focalLengthPhotoStandard"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasLensNd4xNeutralDensityFilter"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensDiameter"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensDispersionGlassType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;opticalZoom"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;maximumMagnification"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensApertureWide"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensLength"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensElementsType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;minimumFocusDistance"/>
```

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                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
14415       </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;focalLengthMovieWide"/>
14420           <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
14425       <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensApertureTele"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
14430   </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;powerRequirement"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
14435           <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
14440           <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceLensThreadGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
14445   <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensApertureBlades"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
14450       </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;angleOfView"/>
14455           <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
14460       <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;focalLengthPhotoWide"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
14465   </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;angleOfViewFullFrame"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
14470           <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
14475           <owl:onProperty rdf:resource="&cameraontology;focalLengthMovieStandard"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueFloat"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
14480   <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensApertureForm"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
14485       </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensType"/>
14490           <owl:onClass rdf:resource="&cameraontology;LensType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
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            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;sensorMatch"/>
                <owl:onClass rdf:resource="&cameraontology;SensorFormat"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;isLensLightEdition"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensElements"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;accessoryInterfaceLensThread"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;cameraInterfaceMount"/>
                <owl:onClass rdf:resource="&cameraontology;MountType"/>
                <owl:qualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:qualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;hasLensWeatherSealing"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;boolean"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Lens.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN891002-tax -->

    <owl:Class rdf:about="&eco;C_AKN891002-tax">
        <rdfs:label xml:lang="en">Lens 19100204 [Taxonomy Concept: Anything that may be an instance of this category in any
    ↪   context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100204</eco:hierarchyCode>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Lens. It includes both related types of goods (e.g.accessories, supplies,...) and items
    ↪   that are no actual goods of this kind but related to the respective category (e.g. expenses reflecting such
    ↪   goods).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN892002-gen -->

    <owl:Class rdf:about="&eco;C_AKN892002-gen">
        <rdfs:label xml:lang="en">Filter (Photo camera, video camera) [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN892002-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThreadGender"/>
                <owl:onClass rdf:resource="&cameraontology;Gender"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
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        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;lensInterfaceLensThread"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValueInteger"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Filter (Photo camera, video camera).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN892002-tax -->

    <owl:Class rdf:about="&eco;C_AKN892002-tax">
        <rdfs:label xml:lang="en">Filter (Photo camera, video camera) 19100205 [Taxonomy Concept: Anything that may be an
    ↪   instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
    ↪   services in any relevant context: Filter (Photo camera, video camera). It includes both related types of goods
    ↪   (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
    ↪   (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN894002-gen -->

    <owl:Class rdf:about="&eco;C_AKN894002-gen">
        <rdfs:label xml:lang="en">Bag and case for photo camera and video camera [Generic Concept: This type of
    ↪   goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN894002-tax"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;material"/>
                <owl:someValuesFrom rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;usageType"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
                <owl:onDataRange rdf:resource="&xsd;string"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;interiorHeight"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;interiorWidth"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="&cameraontology;interiorDepth"/>
                <owl:onClass rdf:resource="&gr;QuantitativeValue"/>
                <owl:maxQualifiedCardinality rdf:datatype="&xsd;nonNegativeInteger">1</owl:maxQualifiedCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
    ↪   specializations: Bag and case for photo camera and video camera.</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:Class>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_AKN894002-tax -->
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    <owl:Class rdf:about="&eco;C_AKN894002-tax">
        <rdfs:label xml:lang="en">Bag and case for photo camera and video camera 19100207 [Taxonomy Concept: Anything that may be
↪    an instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100207</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
↪    services in any relevant context: Bag and case for photo camera and video camera. It includes both related types of goods
↪    (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
↪    (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_BAC378001-gen -->

    <owl:Class rdf:about="&eco;C_BAC378001-gen">
        <rdfs:label xml:lang="en">Docking station (camera, video camera) [Generic Concept: This type of goods]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&gr;ProductOrService"/>
        <rdfs:subClassOf rdf:resource="&eco;C_BAC378001-tax"/>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes all actual instances of the following type of goods and true
↪    specializations: Docking station (camera, video camera).</rdfs:comment>
    </owl:Class>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#C_BAC378001-tax -->

    <owl:Class rdf:about="&eco;C_BAC378001-tax">
        <rdfs:label xml:lang="en">Docking station (camera, video camera) 19100208 [Taxonomy Concept: Anything that may be an
↪    instance of this category in any context]</rdfs:label>
        <rdfs:subClassOf rdf:resource="&eco;C_AKN887003-tax"/>
        <eco:hierarchyCode rdf:datatype="&xsd;integer">19100208</eco:hierarchyCode>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">This class subsumes everything that is a member of the following category of products or
↪    services in any relevant context: Docking station (camera, video camera). It includes both related types of goods
↪    (e.g.accessories, supplies,...) and items that are no actual goods of this kind but related to the respective category
↪    (e.g. expenses reflecting such goods).</rdfs:comment>
    </owl:Class>


    <!-- http://xmlns.com/foaf/0.1/Agent -->

    <owl:Class rdf:about="&foaf;Agent">
        <rdfs:label xml:lang="en">Agent</rdfs:label>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An agent (eg. person, group, software or physical artifact).</rdfs:comment>
    </owl:Class>


    <!-- http://xmlns.com/foaf/0.1/Document -->

    <owl:Class rdf:about="&foaf;Document">
        <rdfs:label xml:lang="en">Document</rdfs:label>
        <rdfs:comment xml:lang="en">A document.</rdfs:comment>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
    </owl:Class>


    <!-- http://xmlns.com/foaf/0.1/Image -->

    <owl:Class rdf:about="&foaf;Image">
        <rdfs:label xml:lang="en">Image</rdfs:label>
        <rdfs:subClassOf rdf:resource="&foaf;Document"/>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An image.</rdfs:comment>
    </owl:Class>


    <!-- http://xmlns.com/foaf/0.1/Organization -->

    <owl:Class rdf:about="&foaf;Organization">
        <rdfs:label xml:lang="en">Organization</rdfs:label>
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        <rdfs:subClassOf rdf:resource="&foaf;Agent"/>
        <owl:disjointWith rdf:resource="&foaf;Person"/>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">An organization.</rdfs:comment>
    </owl:Class>


    <!-- http://xmlns.com/foaf/0.1/Person -->

    <owl:Class rdf:about="&foaf;Person">
        <rdfs:label xml:lang="en">Person</rdfs:label>
        <rdfs:subClassOf rdf:resource="&foaf;Agent"/>
        <rdfs:isDefinedBy>http://xmlns.com/foaf/0.1/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A person.</rdfs:comment>
    </owl:Class>


    <!--
    ///////////////////////////////////////////////////////////////////////////////////
    //
    // Individuals
    //
    ///////////////////////////////////////////////////////////////////////////////////
     -->


    <!-- http://purl.org/dc/terms/Agent -->

    <owl:NamedIndividual rdf:about="&dcterms;Agent">
        <rdf:type rdf:resource="&dcterms;AgentClass"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AC_Move -->

    <owl:NamedIndividual rdf:about="&cameraontology;AC_Move">
        <rdf:type rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:label xml:lang="en">Move</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Auto Condition: &amp;apos;Move&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AC_MoveBright -->

    <owl:NamedIndividual rdf:about="&cameraontology;AC_MoveBright">
        <rdf:type rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:label xml:lang="en">Move Bright</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Auto Condition: &amp;apos;Move Bright&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AC_MoveDark -->

    <owl:NamedIndividual rdf:about="&cameraontology;AC_MoveDark">
        <rdf:type rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:label xml:lang="en">Move Dark</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Auto Condition: &amp;apos;Move Dark&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AC_Tripod -->

    <owl:NamedIndividual rdf:about="&cameraontology;AC_Tripod">
        <rdf:type rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:label xml:lang="en">Tripod</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Auto Condition: &amp;apos;Tripod&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AC_Walk -->

    <owl:NamedIndividual rdf:about="&cameraontology;AC_Walk">
        <rdf:type rdf:resource="&cameraontology;AutoCondition"/>
        <rdfs:label xml:lang="en">Walk</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Auto Condition: &apos;Walk&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_AVR_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_AVR_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">AVR Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;AVR Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Audio_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Audio_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Audio Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Audio Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_COMP_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_COMP_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">COMP Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;COMP Out&apos;. Comp stands for composite.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_DI_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_DI_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">DI Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;DI Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_DV_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_DV_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">DV In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;DV In&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_DV_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_DV_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">DV Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;DV Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>
```

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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Full_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Full_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Full In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Full In&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Full_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Full_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Full Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Full Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Micro_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Micro_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Micro In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Micro In&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Micro_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Micro_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Micro Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Micro Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Mini_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Mini_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Mini In</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Mini In&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_HDMI_Mini_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_HDMI_Mini_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">HDMI Mini Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;HDMI Mini Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Headphone_Minijack_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Headphone_Minijack_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Headphone Minijack Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Headphone Minijack Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Microphone_Minijack_In -->
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    <owl:NamedIndividual rdf:about="&cameraontology;AV_Microphone_Minijack_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Microphone Minijack In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Microphone Minijack In&apos;.</rdfs:comment>
14950   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



14955   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Minijack_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Minijack_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Minijack Out</rdfs:label>
14960   <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Minijack Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



14965
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_RCA_Mono_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_RCA_Mono_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
14970   <rdfs:label xml:lang="en">RCA Mono In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;RCA Mono In&apos;.

An RCA connector, sometimes called a phono connector or cinch connector, is a type of electrical connector commonly used to
  ↪    carry audio and video signals. The connectors are also sometimes casually referred to as A/V jacks. The name
  ↪    &quot;RCA&quot; derives from the Radio Corporation of America, which introduced the design by the early 1940s for
  ↪    internal connection of the pickup to the chassis in home radio-phonograph consoles. It was originally a low-cost, simple
  ↪    design, intended only for mating and disconnection when servicing the console. Refinement came with later designs,
  ↪    although they remained compatible.

14975   RCA connectors began to replace the older quarter-inch phone connectors for many other applications in the consumer audio world
  ↪    when component high-fidelity systems started becoming popular in the 1950s. However, quarter-inch phone connectors are
  ↪    still common in professional audio, while miniature phone connectors (3.5 mm) have become predominant in personal stereo
  ↪    systems.

    The connection&apos;s plug is called an RCA plug or phono plug, for &quot;phonograph.&quot; The name &quot;phono plug&quot; is
  ↪    sometimes confused with a &quot;phone plug&quot; which may refer to a quarter-inch &quot;phone plug&quot; - Tip/Sleeve
  ↪    (TS) or Tip/Ring/Sleeve (TRS) connector - or to a 4P4C connector used for a telephone (which is often, though incorrectly,
  ↪    called &quot;RJ9&quot;, &quot;RJ10&quot;, or &quot;RJ22&quot;).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
14980



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_RCA_Mono_Out -->

14985   <owl:NamedIndividual rdf:about="&cameraontology;AV_RCA_Mono_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">RCA Mono Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;RCA Mono Out&apos;.
14990
    An RCA connector, sometimes called a phono connector or cinch connector, is a type of electrical connector commonly used to
  ↪    carry audio and video signals. The connectors are also sometimes casually referred to as A/V jacks. The name
  ↪    &quot;RCA&quot; derives from the Radio Corporation of America, which introduced the design by the early 1940s for
  ↪    internal connection of the pickup to the chassis in home radio-phonograph consoles. It was originally a low-cost, simple
  ↪    design, intended only for mating and disconnection when servicing the console. Refinement came with later designs,
  ↪    although they remained compatible.

    RCA connectors began to replace the older quarter-inch phone connectors for many other applications in the consumer audio world
  ↪    when component high-fidelity systems started becoming popular in the 1950s. However, quarter-inch phone connectors are
  ↪    still common in professional audio, while miniature phone connectors (3.5 mm) have become predominant in personal stereo
  ↪    systems.

14995   The connection&apos;s plug is called an RCA plug or phono plug, for &quot;phonograph.&quot; The name &quot;phono plug&quot; is
  ↪    sometimes confused with a &quot;phone plug&quot; which may refer to a quarter-inch &quot;phone plug&quot; - Tip/Sleeve
  ↪    (TS) or Tip/Ring/Sleeve (TRS) connector - or to a 4P4C connector used for a telephone (which is often, though incorrectly,
  ↪    called &quot;RJ9&quot;, &quot;RJ10&quot;, or &quot;RJ22&quot;).</rdfs:comment>
    </owl:NamedIndividual>



15000   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_RCA_Stereo_In -->
```

```
    <owl:NamedIndividual rdf:about="&cameraontology;AV_RCA_Stereo_In">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">RCA Stereo In</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;RCA Stereo In&apos;.

An RCA connector, sometimes called a phono connector or cinch connector, is a type of electrical connector commonly used to
  ↪ carry audio and video signals. The connectors are also sometimes casually referred to as A/V jacks. The name
  ↪ &quot;RCA&quot; derives from the Radio Corporation of America, which introduced the design by the early 1940s for
  ↪ internal connection of the pickup to the chassis in home radio-phonograph consoles. It was originally a low-cost, simple
  ↪ design, intended only for mating and disconnection when servicing the console. Refinement came with later designs,
  ↪ although they remained compatible.

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  ↪ when component high-fidelity systems started becoming popular in the 1950s. However, quarter-inch phone connectors are
  ↪ still common in professional audio, while miniature phone connectors (3.5 mm) have become predominant in personal stereo
  ↪ systems.

The connection&apos;s plug is called an RCA plug or phono plug, for &quot;phonograph.&quot; The name &quot;phono plug&quot; is
  ↪ sometimes confused with a &quot;phone plug&quot; which may refer to a quarter-inch &quot;phone plug&quot; - Tip/Sleeve
  ↪ (TS) or Tip/Ring/Sleeve (TRS) connector - or to a 4P4C connector used for a telephone (which is often, though incorrectly,
  ↪ called &quot;RJ9&quot;, &quot;RJ10&quot;, or &quot;RJ22&quot;).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_RCA_Stereo_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_RCA_Stereo_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">RCA Stereo Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;RCA Stereo Out&apos;.

An RCA connector, sometimes called a phono connector or cinch connector, is a type of electrical connector commonly used to
  ↪ carry audio and video signals. The connectors are also sometimes casually referred to as A/V jacks. The name
  ↪ &quot;RCA&quot; derives from the Radio Corporation of America, which introduced the design by the early 1940s for
  ↪ internal connection of the pickup to the chassis in home radio-phonograph consoles. It was originally a low-cost, simple
  ↪ design, intended only for mating and disconnection when servicing the console. Refinement came with later designs,
  ↪ although they remained compatible.

RCA connectors began to replace the older quarter-inch phone connectors for many other applications in the consumer audio world
  ↪ when component high-fidelity systems started becoming popular in the 1950s. However, quarter-inch phone connectors are
  ↪ still common in professional audio, while miniature phone connectors (3.5 mm) have become predominant in personal stereo
  ↪ systems.

The connection&apos;s plug is called an RCA plug or phono plug, for &quot;phonograph.&quot; The name &quot;phono plug&quot; is
  ↪ sometimes confused with a &quot;phone plug&quot; which may refer to a quarter-inch &quot;phone plug&quot; - Tip/Sleeve
  ↪ (TS) or Tip/Ring/Sleeve (TRS) connector - or to a 4P4C connector used for a telephone (which is often, though incorrectly,
  ↪ called &quot;RJ9&quot;, &quot;RJ10&quot;, or &quot;RJ22&quot;).</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Remote_Minijack_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Remote_Minijack_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Remote Minijack Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Remote Minijack Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Stereo_Minijack_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Stereo_Minijack_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Stereo Minijack Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Stereo Minijack Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_USB_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_USB_In">
```

```
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">USB In</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;USB In&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_USB_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_USB_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">USB Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;USB Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#AV_Video_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;AV_Video_Out">
        <rdf:type rdf:resource="&cameraontology;AudioVideo"/>
        <rdfs:label xml:lang="en">Video Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Audio/Video Port: &apos;Video Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_A -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_A">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">A</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;A&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_AA -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_AA">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">AA</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;AA&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_AAA -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_AAA">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">AAA</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;AAA&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_BG -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_BG">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">BG</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;BG&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_BTN-R -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_BTN-R">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">BTN-R</rdfs:label>
```

```
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;BTN-R&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_C -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_C">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">C</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;C&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_D -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_D">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">D</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;D&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_F -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_F">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">F</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;F&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_FG -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_FG">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">FG</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;FG&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_H -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_H">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">H</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;H&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_K -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_K">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">K</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;K&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_L2 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_L2">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">L2</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;L2&apos;.</rdfs:comment>
```

```
    </owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_L3 -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_L3">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">L3</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;L3&apos;.</rdfs:comment>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_L5 -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_L5">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">L5</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;L5&apos;.</rdfs:comment>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_L7 -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_L7">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">L7</rdfs:label>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;L7&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_L9 -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_L9">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">L9</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;L9&apos;.</rdfs:comment>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_LR44 -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_LR44">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">LR44</rdfs:label>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;LR44&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_M -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_M">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">M</rdfs:label>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;M&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_MH -->

<owl:NamedIndividual rdf:about="&cameraontology;BT_MH">
    <rdf:type rdf:resource="&cameraontology;BatteryType"/>
    <rdfs:label xml:lang="en">MH</rdfs:label>
    <rdfs:comment xml:lang="en">The Battery Type: &apos;MH&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_N -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_N">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">N</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;N&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_NH -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_NH">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">NH</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;NH&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_P -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_P">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">P</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;P&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_P2 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_P2">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">P2</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;P2&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_P6 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_P6">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">P6</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;P6&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_P7 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_P7">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">P7</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;P7&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_P9 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_P9">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">P9</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;P9&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_Q -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_Q">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">Q</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;Q&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_R -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_R">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">R</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;R&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_S1 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_S1">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">S1</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;S1&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_S2 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_S2">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">S2</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;S2&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_S3 -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_S3">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">S3</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;S3&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_T -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_T">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">T</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;T&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_V -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_V">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">V</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;V&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_W -->
```

```
    <owl:NamedIndividual rdf:about="&cameraontology;BT_W">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">W</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;W&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_X -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_X">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">X</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;X&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#BT_Y -->

    <owl:NamedIndividual rdf:about="&cameraontology;BT_Y">
        <rdf:type rdf:resource="&cameraontology;BatteryType"/>
        <rdfs:label xml:lang="en">Y</rdfs:label>
        <rdfs:comment xml:lang="en">The Battery Type: &apos;Y&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#B_GridLine -->

    <owl:NamedIndividual rdf:about="&cameraontology;B_GridLine">
        <rdf:type rdf:resource="&cameraontology;Button"/>
        <rdfs:label xml:lang="en">Grid Line</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">A Grid Line feature button.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#B_Photo -->

    <owl:NamedIndividual rdf:about="&cameraontology;B_Photo">
        <rdf:type rdf:resource="&cameraontology;Button"/>
        <rdfs:label xml:lang="en">Photo</rdfs:label>
        <rdfs:comment xml:lang="en">Photo button.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#B_Power -->

    <owl:NamedIndividual rdf:about="&cameraontology;B_Power">
        <rdf:type rdf:resource="&cameraontology;Button"/>
        <rdfs:label xml:lang="en">Power</rdfs:label>
        <rdfs:comment xml:lang="en">Power button.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#B_PushRelease -->

    <owl:NamedIndividual rdf:about="&cameraontology;B_PushRelease">
        <rdf:type rdf:resource="&cameraontology;Button"/>
        <rdfs:label xml:lang="en">Push Release</rdfs:label>
        <rdfs:comment xml:lang="en">Push/Release button.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#B_StartStop -->

    <owl:NamedIndividual rdf:about="&cameraontology;B_StartStop">
        <rdf:type rdf:resource="&cameraontology;Button"/>
```

```
        <rdfs:label xml:lang="en">Start Stop</rdfs:label>
        <rdfs:comment xml:lang="en">Start Stop button.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_AdobeRGB -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_AdobeRGB">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Adobe RGB</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Adobe RGB&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_AutumnLeaves -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_AutumnLeaves">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Autumn Leaves</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Autumn Leaves&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_BlackWhite -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_BlackWhite">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Black White</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Black White&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_BoxContrast -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_BoxContrast">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Box Contrast</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Box Contrast&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_BoxSaturation -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_BoxSaturation">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Box Saturation</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Box  Saturation&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_BoxSharpness -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_BoxSharpness">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Box Sharpness</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Box Sharpness&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Brightness -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Brightness">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Brightness</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Brightness&apos;.</rdfs:comment>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Clear -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Clear">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Clear</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Clear&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Deep -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Deep">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Deep</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Deep&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Landscape -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Landscape">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Landscape</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Landscape&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Light -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Light">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Light</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Light&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Neutral -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Neutral">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Neutral</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Neutral&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_NightScene -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_NightScene">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Night Scene</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Night Scene&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Portrait -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSCM_Portrait">
        <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
        <rdfs:label xml:lang="en">Portrait</rdfs:label>
        <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Portrait&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Real -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_Real">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Real</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Real&apos;.</rdfs:comment>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Sepia -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_Sepia">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Sepia</rdfs:label>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Sepia&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Standard -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_Standard">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Standard</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Standard&apos;.</rdfs:comment>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Sunset -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_Sunset">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Sunset</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Sunset&apos;.</rdfs:comment>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_Vivid -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_Vivid">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Vivid</rdfs:label>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Vivid&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSCM_ZoneMatching -->

<owl:NamedIndividual rdf:about="&cameraontology;CSCM_ZoneMatching">
    <rdf:type rdf:resource="&cameraontology;CreativeStyleColorMode"/>
    <rdfs:label xml:lang="en">Zone Matching</rdfs:label>
    <rdfs:comment xml:lang="en">The Creative Style Color Mode: &apos;Zone Matching&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSS_AdobeRGB -->

<owl:NamedIndividual rdf:about="&cameraontology;CSS_AdobeRGB">
    <rdf:type rdf:resource="&cameraontology;ColorSpaceSetting"/>
    <rdfs:label xml:lang="en">Adobe RGB</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Adobe RGB (Red/Green/Blue) color space.</rdfs:comment>
</owl:NamedIndividual>
```

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15770
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CSS_sRGB -->

    <owl:NamedIndividual rdf:about="&cameraontology;CSS_sRGB">
        <rdf:type rdf:resource="&cameraontology;ColorSpaceSetting"/>
15775   <rdfs:label xml:lang="en">sRGB</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">sRGB is a standard RGB color space created cooperatively by HP and Microsoft in 1996 for use
  ↪    on monitors, printers and the Internet.

sRGB uses the ITU-R BT.709 primaries, the same as are used in studio monitors and HDTV,[1] and a transfer function (gamma curve)
  ↪    typical of CRTs. This specification allowed sRGB to be directly displayed on typical CRT monitors of the time, a factor
  ↪    which greatly aided its acceptance.
15780
Unlike most other RGB color spaces, the sRGB gamma cannot be expressed as a single numerical value. The overall gamma is
  ↪    approximately 2.2, consisting of a linear (gamma 1.0) section near black, and a non-linear section elsewhere involving a
  ↪    2.4 exponent and a gamma (slope of log output versus log input) changing from 1.0 through about 2.3.</rdfs:comment>
    </owl:NamedIndividual>


15785
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#CameraOntology -->

    <owl:NamedIndividual rdf:about="&cameraontology;CameraOntology">
        <rdf:type rdf:resource="&foaf;Document"/>
15790   <rdfs:label xml:lang="en">Camera Ontology</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Camera Ontology URL</rdfs:comment>
    </owl:NamedIndividual>

15795
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_FlashSyncTerminal_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_FlashSyncTerminal_In">
15800       <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Flash Sync Terminal In</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Data Port: &apos;Flash Sync Terminal In&apos;.</rdfs:comment>
    </owl:NamedIndividual>
15805

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_FlashSyncTerminal_Out -->

15810   <owl:NamedIndividual rdf:about="&cameraontology;D_FlashSyncTerminal_Out">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Flash Sync Terminal Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Data Port: &apos;Flash Sync Terminal Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
15815   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_Remote_IR_In -->
15820
    <owl:NamedIndividual rdf:about="&cameraontology;D_Remote_IR_In">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Remote IR In</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
15825       <rdfs:comment xml:lang="en">The Data Port: &apos;Remote IR In&apos;.</rdfs:comment>
    </owl:NamedIndividual>


15830   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_Remote_IR_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_Remote_IR_Out">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Remote IR Out</rdfs:label>
15835       <rdfs:comment xml:lang="en">The Data Port: &apos;Remote IR Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


15840
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_USB_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_USB_In">
```

```
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">USB In</rdfs:label>
        <rdfs:comment xml:lang="en">The Data Port: &apos;USB In&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_USB_Micro_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_USB_Micro_Out">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">USB Micro Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Data Port: &apos;USB Micro Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_USB_Mini_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_USB_Mini_Out">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">USB Mini Out</rdfs:label>
        <rdfs:comment xml:lang="en">The Data Port: &apos;USB Mini Out&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_WiredRemoteTerminal_In -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_WiredRemoteTerminal_In">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Wired Remote Terminal In</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Data Port: &apos;Wired Remote Terminal In&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#D_WiredRemoteTerminal_Out -->

    <owl:NamedIndividual rdf:about="&cameraontology;D_WiredRemoteTerminal_Out">
        <rdf:type rdf:resource="&cameraontology;Data"/>
        <rdfs:label xml:lang="en">Wired Remote Terminal Out</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Data Port: &apos;Wired Remote Terminal Out&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ECT_A -->

    <owl:NamedIndividual rdf:about="&cameraontology;ECT_A">
        <rdf:type rdf:resource="&cameraontology;EyeCupType"/>
        <rdfs:label xml:lang="en">A</rdfs:label>
        <rdfs:comment xml:lang="en">The Eye-Cup Type: &apos;A&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FDF_Party -->

    <owl:NamedIndividual rdf:about="&cameraontology;FDF_Party">
        <rdf:type rdf:resource="&cameraontology;FaceDetectionFeature"/>
        <rdfs:label xml:lang="en">Party</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Face Detection Feature: &apos;Party&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FDF_SoftSkin -->

    <owl:NamedIndividual rdf:about="&cameraontology;FDF_SoftSkin">
        <rdf:type rdf:resource="&cameraontology;FaceDetectionFeature"/>
        <rdfs:label xml:lang="en">Soft Skin</rdfs:label>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Face Detection Feature: &apos;Soft Skin&apos;.</rdfs:comment>
15925   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_AdultPriority -->
15930
    <owl:NamedIndividual rdf:about="&cameraontology;FD_AdultPriority">
        <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:label xml:lang="en">Adult Priority</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
15935   <rdfs:comment xml:lang="en">The Face Detection: &apos;Adult Priority&apos;.</rdfs:comment>
    </owl:NamedIndividual>


15940   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_Auto -->

    <owl:NamedIndividual rdf:about="&cameraontology;FD_Auto">
        <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:label xml:lang="en">Auto</rdfs:label>
15945   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Face Detection: &apos;Auto&apos;.</rdfs:comment>
    </owl:NamedIndividual>


15950
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_ChildPriority -->

    <owl:NamedIndividual rdf:about="&cameraontology;FD_ChildPriority">
        <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
15955   <rdfs:label xml:lang="en">Child Priority</rdfs:label>
        <rdfs:comment xml:lang="en">The Face Detection: &apos;Child Priority&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

15960

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_ObjectFraming -->

    <owl:NamedIndividual rdf:about="&cameraontology;FD_ObjectFraming">
15965   <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:label xml:lang="en">Object Framing</rdfs:label>
        <rdfs:comment xml:lang="en">The Face Detection: &apos;Object Framing&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
15970


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_RedEye -->

15975   <owl:NamedIndividual rdf:about="&cameraontology;FD_RedEye">
        <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:label xml:lang="en">Red Eye</rdfs:label>
        <rdfs:comment xml:lang="en">The Face Detection: &apos;Red Eye&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
15980   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FD_Registered -->
15985
    <owl:NamedIndividual rdf:about="&cameraontology;FD_Registered">
        <rdf:type rdf:resource="&cameraontology;FaceDetection"/>
        <rdfs:label xml:lang="en">Registered</rdfs:label>
        <rdfs:comment xml:lang="en">The Face Detection: &apos;Registered&apos; (a predefined area).</rdfs:comment>
15990   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


15995   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FEL_PentaDach -->

    <owl:NamedIndividual rdf:about="&cameraontology;FEL_PentaDach">
        <rdf:type rdf:resource="&cameraontology;FixedEyeLevelSystem"/>
        <rdfs:label xml:lang="en">Penta Dach</rdfs:label>
16000   <rdfs:comment xml:lang="en">A Dach eye-level system.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
```

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    </owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FEL_PentaMirror -->

<owl:NamedIndividual rdf:about="&cameraontology;FEL_PentaMirror">
    <rdf:type rdf:resource="&cameraontology;FixedEyeLevelSystem"/>
    <rdfs:label xml:lang="en">Penta Mirror</rdfs:label>
    <rdfs:comment xml:lang="en">A Mirror eye-level system.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FEL_PentaPrism -->

<owl:NamedIndividual rdf:about="&cameraontology;FEL_PentaPrism">
    <rdf:type rdf:resource="&cameraontology;FixedEyeLevelSystem"/>
    <rdfs:label xml:lang="en">Penta Prism</rdfs:label>
    <rdfs:comment xml:lang="en">A Prism eye-level system.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_Auto -->

<owl:NamedIndividual rdf:about="&cameraontology;FM_Auto">
    <rdf:type rdf:resource="&cameraontology;FlashMode"/>
    <rdfs:label xml:lang="en">Auto</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Flash Mode: &apos;Auto&apos;.</rdfs:comment>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_Fill -->

<owl:NamedIndividual rdf:about="&cameraontology;FM_Fill">
    <rdf:type rdf:resource="&cameraontology;FlashMode"/>
    <rdfs:label xml:lang="en">Fill</rdfs:label>
    <rdfs:comment xml:lang="en">The Flash Mode: &apos;Fill&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_HighSpeedSync -->

<owl:NamedIndividual rdf:about="&cameraontology;FM_HighSpeedSync">
    <rdf:type rdf:resource="&cameraontology;FlashMode"/>
    <rdfs:label xml:lang="en">High Speed Sync</rdfs:label>
    <rdfs:comment xml:lang="en">The Flash Mode: &apos;High Speed Sync&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_Off -->

<owl:NamedIndividual rdf:about="&cameraontology;FM_Off">
    <rdf:type rdf:resource="&cameraontology;FlashMode"/>
    <rdfs:label xml:lang="en">Off</rdfs:label>
    <rdfs:comment xml:lang="en">The Flash Mode: &apos;Off&apos;.</rdfs:comment>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
</owl:NamedIndividual>


<!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_RearSync -->

<owl:NamedIndividual rdf:about="&cameraontology;FM_RearSync">
    <rdf:type rdf:resource="&cameraontology;FlashMode"/>
    <rdfs:label xml:lang="en">Rear Sync</rdfs:label>
    <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    <rdfs:comment xml:lang="en">The Flash Mode: &apos;Rear Sync&apos;.</rdfs:comment>
</owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_RedEyeReduction -->

    <owl:NamedIndividual rdf:about="&cameraontology;FM_RedEyeReduction">
        <rdf:type rdf:resource="&cameraontology;FlashMode"/>
        <rdfs:label xml:lang="en">Red Eye Reduction</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Flash Mode: &apos;Red Eye Reduction&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_SlowSync -->

    <owl:NamedIndividual rdf:about="&cameraontology;FM_SlowSync">
        <rdf:type rdf:resource="&cameraontology;FlashMode"/>
        <rdfs:label xml:lang="en">Slow Sync</rdfs:label>
        <rdfs:comment xml:lang="en">The Flash Mode: &apos;Slow Sync&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#FM_Wireless -->

    <owl:NamedIndividual rdf:about="&cameraontology;FM_Wireless">
        <rdf:type rdf:resource="&cameraontology;FlashMode"/>
        <rdfs:label xml:lang="en">Wireless</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Flash Mode: &apos;Wireless&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#GT_A7 -->

    <owl:NamedIndividual rdf:about="&cameraontology;GT_A7">
        <rdf:type rdf:resource="&cameraontology;GripType"/>
        <rdfs:label xml:lang="en">A7</rdfs:label>
        <rdfs:comment xml:lang="en">The Grip Type: &apos;A7&apos;.

This black Vertical Battery Grip from Sony allows for long-term, comfortable shooting in the vertical orientation with your
  ↪    Alpha a7/a7R/a7S digital camera. It accepts 1-2 NP-FW50 batteries, which are available separately, to extend and possibly
  ↪    even double your shooting time. The grip uses a battery with lower power first, then automatically switches to the one
  ↪    with greater power when the first runs out. Remaining battery power is displayed as a percentage on your camera&apos;s
  ↪    LCD monitor.

The grip offers an extra shutter button, located at the low position, as well as front/back control dials and Auto Exposure Lock.
  ↪    All controls are placed appropriately for easy, comfortable access. A strap hole allows you to attach the optional
  ↪    STP-GB1AM Grip Belt. The buttons, dials, battery cover and connecting terminal on the grip are securely sealed for dust
  ↪    and moisture protection.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#G_Female -->

    <owl:NamedIndividual rdf:about="&cameraontology;G_Female">
        <rdf:type rdf:resource="&cameraontology;Gender"/>
        <rdfs:label xml:lang="en">Female</rdfs:label>
        <rdfs:comment xml:lang="en">The Female Gender.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#G_Male -->

    <owl:NamedIndividual rdf:about="&cameraontology;G_Male">
        <rdf:type rdf:resource="&cameraontology;Gender"/>
        <rdfs:label xml:lang="en">Male</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Male Gender.</rdfs:comment>
    </owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_BackLight -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_BackLight">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Back Light</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Back Light&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_BackLightPortrait -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_BackLightPortrait">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Back Light Portrait</rdfs:label>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Back Light Portrait&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_CloseFocus -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_CloseFocus">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Close Focus</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Close Focus&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_HandHeldTwilight -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_HandHeldTwilight">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Hand Held Twilight</rdfs:label>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Hand Held Twilight&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_Infant -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_Infant">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Infant</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Infant&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_Landscape -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_Landscape">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Landscape</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Landscape&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_LowLight -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_LowLight">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Low Light</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &apos;Low Light&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_Macro -->
```

```
    <owl:NamedIndividual rdf:about="&cameraontology;IARS_Macro">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Macro</rdfs:label>
16235   <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Macro&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


16240
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_NightPortrait -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_NightPortrait">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
16245   <rdfs:label xml:lang="en">Night Portrait</rdfs:label>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Night Portrait&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

16250

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_NightScene -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_NightScene">
16255       <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Night Scene</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Night Scene&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>
16260


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_NightSceneTripod -->

16265   <owl:NamedIndividual rdf:about="&cameraontology;IARS_NightSceneTripod">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Night Scene Tripod</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Night Scene Tripod&amp;apos;.</rdfs:comment>
16270   </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_Portrait -->
16275
    <owl:NamedIndividual rdf:about="&cameraontology;IARS_Portrait">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Portrait</rdfs:label>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Portrait&amp;apos;.</rdfs:comment>
16280       <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



16285   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_SpotLight -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_SpotLight">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
        <rdfs:label xml:lang="en">Spot Light</rdfs:label>
16290       <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Spot Light&amp;apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


16295
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#IARS_Underwater -->

    <owl:NamedIndividual rdf:about="&cameraontology;IARS_Underwater">
        <rdf:type rdf:resource="&cameraontology;IntelligentAutoRecognitionScene"/>
16300       <rdfs:label xml:lang="en">Underwater</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Intelligent Auto Recognition Scene: &amp;apos;Underwater&amp;apos;.</rdfs:comment>
    </owl:NamedIndividual>

16305


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LC_ActiveOpticalImageStabilization -->

    <owl:NamedIndividual rdf:about="&cameraontology;LC_ActiveOpticalImageStabilization">
16310       <rdf:type rdf:resource="&cameraontology;LensCorrection"/>
```

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        <rdfs:label xml:lang="en">Active Optical Image Stabilization</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Correction: &apos;Active Optical Image Stabilization&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LC_AutoClutch -->

    <owl:NamedIndividual rdf:about="&cameraontology;LC_AutoClutch">
        <rdf:type rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:label xml:lang="en">Auto Clutch</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Correction: &apos;Auto Clutch&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LC_CameraBasedAbberationCorrection -->

    <owl:NamedIndividual rdf:about="&cameraontology;LC_CameraBasedAbberationCorrection">
        <rdf:type rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:label xml:lang="en">Camera Based Abberation Correction</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Correction: &apos;Camera Based Abberation Correction&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LC_LensBasedCameraCorrections -->

    <owl:NamedIndividual rdf:about="&cameraontology;LC_LensBasedCameraCorrections">
        <rdf:type rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:label xml:lang="en">Lens Based Camera Corrections</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Correction: &apos;Lens Based Camera Corrections&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LC_LensBasedOpticalImageStabilization -->

    <owl:NamedIndividual rdf:about="&cameraontology;LC_LensBasedOpticalImageStabilization">
        <rdf:type rdf:resource="&cameraontology;LensCorrection"/>
        <rdfs:label xml:lang="en">Lens Based Optical Image Stabilization</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Correction: &apos;Lens Based Optical Image Stabilization&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_AFNonRotatingFocusRing -->

    <owl:NamedIndividual rdf:about="&cameraontology;LF_AFNonRotatingFocusRing">
        <rdf:type rdf:resource="&cameraontology;LensFocus"/>
        <rdfs:label xml:lang="en">AF Non Rotating Focus Ring</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Focus: &apos;AF Non Rotating Focus Ring&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_CameraBasedADF -->

    <owl:NamedIndividual rdf:about="&cameraontology;LF_CameraBasedADF">
        <rdf:type rdf:resource="&cameraontology;LensFocus"/>
        <rdfs:label xml:lang="en">Camera Based ADF</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Focus: &apos;Camera Based ADF&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_ElectronicFocusRangeLimiter -->

    <owl:NamedIndividual rdf:about="&cameraontology;LF_ElectronicFocusRangeLimiter">
        <rdf:type rdf:resource="&cameraontology;LensFocus"/>
        <rdfs:label xml:lang="en">Electronic Focus Range Limiter</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
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16390       <rdfs:comment xml:lang="en">The Lens Focus: &apos;Electronic Focus Range Limiter&apos;.</rdfs:comment>
        </owl:NamedIndividual>


16395   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_FocusRangeLimiter -->

        <owl:NamedIndividual rdf:about="&cameraontology;LF_FocusRangeLimiter">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
            <rdfs:label xml:lang="en">Focus Range Limiter</rdfs:label>
16400       <rdfs:comment xml:lang="en">The Lens Focus: &apos;Focus Range Limiter&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>


16405
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_HoldBody -->

        <owl:NamedIndividual rdf:about="&cameraontology;LF_HoldBody">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
16410       <rdfs:label xml:lang="en">Hold Body</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The Lens Focus: &apos;Hold Body&apos;.</rdfs:comment>
        </owl:NamedIndividual>

16415

        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_InternalFocussing -->

        <owl:NamedIndividual rdf:about="&cameraontology;LF_InternalFocussing">
16420       <rdf:type rdf:resource="&cameraontology;LensFocus"/>
            <rdfs:label xml:lang="en">Internal Focussing</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The Lens Focus: &apos;Internal Focussing&apos;.</rdfs:comment>
        </owl:NamedIndividual>
16425


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_LensBasedADF -->

16430   <owl:NamedIndividual rdf:about="&cameraontology;LF_LensBasedADF">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
            <rdfs:label xml:lang="en">Lens Based ADF</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Focus: &apos;Lens Based ADF&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
16435   </owl:NamedIndividual>



        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_ManualFocusOnly -->
16440
        <owl:NamedIndividual rdf:about="&cameraontology;LF_ManualFocusOnly">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
            <rdfs:label xml:lang="en">Manual Focus Only</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
16445       <rdfs:comment xml:lang="en">The Lens Focus: &apos;Manual Focus Only&apos;.</rdfs:comment>
        </owl:NamedIndividual>



16450   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_RearFocussing -->

        <owl:NamedIndividual rdf:about="&cameraontology;LF_RearFocussing">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
            <rdfs:label xml:lang="en">Rear Focussing</rdfs:label>
16455       <rdfs:comment xml:lang="en">The Lens Focus: &apos;Rear Focussing&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>


16460
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LF_SmoothTransFocus -->

        <owl:NamedIndividual rdf:about="&cameraontology;LF_SmoothTransFocus">
            <rdf:type rdf:resource="&cameraontology;LensFocus"/>
16465       <rdfs:label xml:lang="en">Smooth Trans Focus</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Focus: &apos;Smooth Trans Focus&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>
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16470
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LM_ADIDistanceEncoder -->

        <owl:NamedIndividual rdf:about="&cameraontology;LM_ADIDistanceEncoder">
16475       <rdf:type rdf:resource="&cameraontology;LensMeasure"/>
            <rdfs:label xml:lang="en">ADI Distance Encoder</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Measure: &apos;ADI Distance Encoder&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>
16480


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LM_AdvancedDistanceIntegration -->

16485   <owl:NamedIndividual rdf:about="&cameraontology;LM_AdvancedDistanceIntegration">
            <rdf:type rdf:resource="&cameraontology;LensMeasure"/>
            <rdfs:label xml:lang="en">Advanced Distance Integration</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Measure: &apos;Advanced Distance Integration&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
16490   </owl:NamedIndividual>


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LM_DepthOfFieldScale -->
16495
        <owl:NamedIndividual rdf:about="&cameraontology;LM_DepthOfFieldScale">
            <rdf:type rdf:resource="&cameraontology;LensMeasure"/>
            <rdfs:label xml:lang="en">Depth Of Field Scale</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
16500       <rdfs:comment xml:lang="en">The Lens Measure: &apos;Depth Of Field Scale&apos;.</rdfs:comment>
        </owl:NamedIndividual>


16505   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LM_DistanceScale -->

        <owl:NamedIndividual rdf:about="&cameraontology;LM_DistanceScale">
            <rdf:type rdf:resource="&cameraontology;LensMeasure"/>
            <rdfs:label xml:lang="en">Distance Scale</rdfs:label>
16510       <rdfs:comment xml:lang="en">The Lens Measure: &apos;Distance Scale&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>


16515
        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_CarlZeiss_Distagon -->

        <owl:NamedIndividual rdf:about="&cameraontology;LT_CarlZeiss_Distagon">
            <rdf:type rdf:resource="&cameraontology;LensType"/>
16520       <rdfs:label xml:lang="en">Carl Zeiss Distagon</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Type: &apos;Carl Zeiss Distagon&apos;.</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        </owl:NamedIndividual>

16525


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_CarlZeiss_Planar -->

        <owl:NamedIndividual rdf:about="&cameraontology;LT_CarlZeiss_Planar">
16530       <rdf:type rdf:resource="&cameraontology;LensType"/>
            <rdfs:label xml:lang="en">Carl Zeiss Planar</rdfs:label>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            <rdfs:comment xml:lang="en">The Lens Type: &apos;Carl Zeiss Planar&apos; (6 elements / 4 groups).</rdfs:comment>
        </owl:NamedIndividual>
16535


        <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_CarlZeiss_Sonnar -->

16540   <owl:NamedIndividual rdf:about="&cameraontology;LT_CarlZeiss_Sonnar">
            <rdf:type rdf:resource="&cameraontology;LensType"/>
            <rdfs:label xml:lang="en">Carl Zeiss Sonnar</rdfs:label>
            <rdfs:comment xml:lang="en">The Lens Type: &apos;Carl Zeiss Sonnar&apos; (7 elements / 3 groups).</rdfs:comment>
            <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
16545   </owl:NamedIndividual>
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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_CarlZeiss_VarioSonnar -->

    <owl:NamedIndividual rdf:about="&cameraontology;LT_CarlZeiss_VarioSonnar">
        <rdf:type rdf:resource="&cameraontology;LensType"/>
        <rdfs:label xml:lang="en">Carl Zeiss Vario-Sonnar</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Type: &apos;Carl Zeiss Vario-Sonnar&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_CarlZeiss_VarioTessar -->

    <owl:NamedIndividual rdf:about="&cameraontology;LT_CarlZeiss_VarioTessar">
        <rdf:type rdf:resource="&cameraontology;LensType"/>
        <rdfs:label xml:lang="en">Carl Zeiss Vario-Tessar</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Type: &apos;Carl Zeiss Vario-Tessar&apos; (4 elements / 3 groups).</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_Minolta_DT -->

    <owl:NamedIndividual rdf:about="&cameraontology;LT_Minolta_DT">
        <rdf:type rdf:resource="&cameraontology;LensType"/>
        <rdfs:label xml:lang="en">Minolta DT</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Type: &apos;Minolta DT&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LT_Sony_G -->

    <owl:NamedIndividual rdf:about="&cameraontology;LT_Sony_G">
        <rdf:type rdf:resource="&cameraontology;LensType"/>
        <rdfs:label xml:lang="en">Sony G</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Type: &apos;Sony G&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LZ_PowerZoom -->

    <owl:NamedIndividual rdf:about="&cameraontology;LZ_PowerZoom">
        <rdf:type rdf:resource="&cameraontology;LensZoom"/>
        <rdfs:label xml:lang="en">Power Zoom</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Zoom: &apos;Power Zoom&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LZ_SmoothAutoFocusMotor -->

    <owl:NamedIndividual rdf:about="&cameraontology;LZ_SmoothAutoFocusMotor">
        <rdf:type rdf:resource="&cameraontology;LensZoom"/>
        <rdfs:label xml:lang="en">Smooth Auto Focus Motor</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Zoom: &apos;Smooth Auto Focus Motor&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LZ_SmoothMotionOptics -->

    <owl:NamedIndividual rdf:about="&cameraontology;LZ_SmoothMotionOptics">
        <rdf:type rdf:resource="&cameraontology;LensZoom"/>
        <rdfs:label xml:lang="en">Smooth Motion Optics</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Zoom: &apos;Smooth Motion Optics&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LZ_SuperSonicWaveMotor -->
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    <owl:NamedIndividual rdf:about="&cameraontology;LZ_SuperSonicWaveMotor">
        <rdf:type rdf:resource="&cameraontology;LensZoom"/>
        <rdfs:label xml:lang="en">Super Sonic Wave Motor</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Lens Zoom: &apos;Super Sonic Wave Motor&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#LZ_SuperSonicWaveMotorZoom -->

    <owl:NamedIndividual rdf:about="&cameraontology;LZ_SuperSonicWaveMotorZoom">
        <rdf:type rdf:resource="&cameraontology;LensZoom"/>
        <rdfs:label xml:lang="en">Super Sonic Wave Motor Zoom</rdfs:label>
        <rdfs:comment xml:lang="en">The Lens Zoom: &apos;Super Sonic Wave Motor Zoom&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MT_A -->

    <owl:NamedIndividual rdf:about="&cameraontology;MT_A">
        <rdf:type rdf:resource="&cameraontology;MountType"/>
        <rdfs:label xml:lang="en">A</rdfs:label>
        <rdfs:comment xml:lang="en">The Mount Type: &apos;A&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#MT_E -->

    <owl:NamedIndividual rdf:about="&cameraontology;MT_E">
        <rdf:type rdf:resource="&cameraontology;MountType"/>
        <rdfs:label xml:lang="en">E</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Mount Type: &apos;E&apos;.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#M_Mono -->

    <owl:NamedIndividual rdf:about="&cameraontology;M_Mono">
        <rdf:type rdf:resource="&cameraontology;Microphone"/>
        <rdfs:label xml:lang="en">Mono</rdfs:label>
        <rdfs:comment xml:lang="en">Microphone in Mono mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#M_Stereo -->

    <owl:NamedIndividual rdf:about="&cameraontology;M_Stereo">
        <rdf:type rdf:resource="&cameraontology;Microphone"/>
        <rdfs:label xml:lang="en">Stereo</rdfs:label>
        <rdfs:comment xml:lang="en">Microphone in Stereo mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PCS_BackgroundDefocus -->

    <owl:NamedIndividual rdf:about="&cameraontology;PCS_BackgroundDefocus">
        <rdf:type rdf:resource="&cameraontology;PhotoCreativitySetting"/>
        <rdfs:label xml:lang="en">Background Defocus</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Photo Creativity Setting: &apos;Background Defocus&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PCS_Brightness -->

    <owl:NamedIndividual rdf:about="&cameraontology;PCS_Brightness">
```

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        <rdf:type rdf:resource="&cameraontology;PhotoCreativitySetting"/>
        <rdfs:label xml:lang="en">Brightness</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Photo Creativity Setting: &apos;Brightness&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PCS_Color -->

    <owl:NamedIndividual rdf:about="&cameraontology;PCS_Color">
        <rdf:type rdf:resource="&cameraontology;PhotoCreativitySetting"/>
        <rdfs:label xml:lang="en">Color</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Photo Creativity Setting: &apos;Color&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PCS_PictureEffect -->

    <owl:NamedIndividual rdf:about="&cameraontology;PCS_PictureEffect">
        <rdf:type rdf:resource="&cameraontology;PhotoCreativitySetting"/>
        <rdfs:label xml:lang="en">Picture Effect</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Photo Creativity Setting: &apos;Picture Effect&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PCS_Vividness -->

    <owl:NamedIndividual rdf:about="&cameraontology;PCS_Vividness">
        <rdf:type rdf:resource="&cameraontology;PhotoCreativitySetting"/>
        <rdfs:label xml:lang="en">Vividness</rdfs:label>
        <rdfs:comment xml:lang="en">The Photo Creativity Setting: &apos;Vividness&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_HDRPainting -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_HDRPainting">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">HDR Painting</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;HDR Painting&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_HighContrastMono -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_HighContrastMono">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">High Contrast Mono</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;High Contrast Mono&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_Illustration -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_Illustration">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Illustration</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Illustration&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_Miniature -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_Miniature">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Miniature</rdfs:label>
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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Miniature&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_PartialColor -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_PartialColor">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Partial Color</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Partial Color&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_PopColor -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_PopColor">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Pop Color</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Pop Color&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_Posterization -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_Posterization">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Posterization</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Posterization&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_PosterizationBlackWhite -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_PosterizationBlackWhite">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Posterization Black White</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Posterization Black White&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_RetroPhoto -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_RetroPhoto">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Retro Photo</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Retro Photo&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_RichToneMono -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_RichToneMono">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Rich Tone Mono</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Rich Tone Mono&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_SoftFocus -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_SoftFocus">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Soft Focus</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Soft Focus&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
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    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_SoftHighKey -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_SoftHighKey">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Soft High Key</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Soft High Key&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_ToyCamera -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_ToyCamera">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Toy Camera</rdfs:label>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Toy Camera&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#PE_WaterColor -->

    <owl:NamedIndividual rdf:about="&cameraontology;PE_WaterColor">
        <rdf:type rdf:resource="&cameraontology;PictureEffect"/>
        <rdfs:label xml:lang="en">Water Color</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Picture Effect: &apos;Water Color&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#Pieter_Stroobants -->

    <owl:NamedIndividual rdf:about="&cameraontology;Pieter_Stroobants">
        <rdf:type rdf:resource="&dcterms;Agent"/>
        <rdfs:label xml:lang="en">Pieter Stroobants</rdfs:label>
        <rdfs:comment xml:lang="en">The Agent &apos;Pieter Stroobants&apos;</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1.0 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1.0">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1.0</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1.0&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/1.3"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_35mm -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_35mm">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">35mm</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;35mm&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_APS-C"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_APS-C -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_APS-C">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">APS-C</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;APS-C&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
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        <gr:greater rdf:resource="&cameraontology;SF_1.0"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SP_Mono -->

    <owl:NamedIndividual rdf:about="&cameraontology;SP_Mono">
        <rdf:type rdf:resource="&cameraontology;Speaker"/>
        <rdfs:label xml:lang="en">Mono</rdfs:label>
        <rdfs:comment xml:lang="en">Speaker in Mono mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SP_Stereo -->

    <owl:NamedIndividual rdf:about="&cameraontology;SP_Stereo">
        <rdf:type rdf:resource="&cameraontology;Speaker"/>
        <rdfs:label xml:lang="en">Stereo</rdfs:label>
        <rdfs:comment xml:lang="en">Speaker in Stereo mode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_3DStillImage -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_3DStillImage">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">3D Still Image</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;3D Still Image&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_AdvancedSportsShooting -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_AdvancedSportsShooting">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Advanced Sports Shooting</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Advanced Sports Shooting&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_AntiMotionBlur -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_AntiMotionBlur">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Anti Motion Blur</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Anti Motion Blur&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_BackLightCorrectionHDR -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_BackLightCorrectionHDR">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Back Light Correction HDR</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Back Light Correction HDR&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_BackgroundDefocus -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_BackgroundDefocus">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Background Defocus</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Background Defocus&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
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17025       <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Beach -->

            <owl:NamedIndividual rdf:about="&cameraontology;SS_Beach">
                <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
                <rdfs:label xml:lang="en">Beach</rdfs:label>
17030           <rdfs:comment xml:lang="en">The Scene Selection: &apos;Beach&apos;.</rdfs:comment>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            </owl:NamedIndividual>


17035
            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_BigSmile -->

            <owl:NamedIndividual rdf:about="&cameraontology;SS_BigSmile">
                <rdf:type rdf:resource="&cameraontology;SmileShutter"/>
17040           <rdfs:label xml:lang="en">Big Smile</rdfs:label>
                <rdfs:label xml:lang="en">The Smile Shutter: &apos;Big Smile&apos;.</rdfs:label>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            </owl:NamedIndividual>

17045


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Electronic -->

            <owl:NamedIndividual rdf:about="&cameraontology;SS_Electronic">
17050           <rdf:type rdf:resource="&cameraontology;SteadyShot"/>
                <rdfs:label xml:lang="en">Electronic</rdfs:label>
                <rdfs:comment xml:lang="en">Electronic SteadyShot.</rdfs:comment>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
            </owl:NamedIndividual>
17055


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Fireworks -->

17060       <owl:NamedIndividual rdf:about="&cameraontology;SS_Fireworks">
                <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
                <rdfs:label xml:lang="en">Fireworks</rdfs:label>
                <rdfs:comment xml:lang="en">The Scene Selection: &apos;Fireworks&apos;.</rdfs:comment>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17065       </owl:NamedIndividual>


            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Gourmet -->
17070
            <owl:NamedIndividual rdf:about="&cameraontology;SS_Gourmet">
                <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
                <rdfs:label xml:lang="en">Gourmet</rdfs:label>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17075           <rdfs:comment xml:lang="en">The Scene Selection: &apos;Gourmet&apos;.</rdfs:comment>
            </owl:NamedIndividual>


17080       <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_HandHeldTwilight -->

            <owl:NamedIndividual rdf:about="&cameraontology;SS_HandHeldTwilight">
                <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
                <rdfs:label xml:lang="en">Hand Held Twilight</rdfs:label>
17085           <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">The Scene Selection: &apos;Hand Held Twilight&apos;.</rdfs:comment>
            </owl:NamedIndividual>


17090
            <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_HighSensitivity -->

            <owl:NamedIndividual rdf:about="&cameraontology;SS_HighSensitivity">
                <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
17095           <rdfs:label xml:lang="en">High Sensitivity</rdfs:label>
                <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
                <rdfs:comment xml:lang="en">The Scene Selection: &apos;High Sensitivity&apos;.</rdfs:comment>
            </owl:NamedIndividual>

17100
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    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_HighSpeedShutter -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_HighSpeedShutter">
17105       <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">High Speed Shutter</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;High Speed Shutter&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
17110


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Landscape -->

17115   <owl:NamedIndividual rdf:about="&cameraontology;SS_Landscape">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Landscape</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Landscape&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17120   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Macro -->
17125
    <owl:NamedIndividual rdf:about="&cameraontology;SS_Macro">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Macro</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17130       <rdfs:comment xml:lang="en">The Scene Selection: &apos;Macro&apos;.</rdfs:comment>
    </owl:NamedIndividual>


17135   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_NightPortrait -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_NightPortrait">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Night Portrait</rdfs:label>
17140       <rdfs:comment xml:lang="en">The Scene Selection: &apos;Night Portrait&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


17145
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_NightScene -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_NightScene">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
17150       <rdfs:label xml:lang="en">Night Scene</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Night Scene&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

17155


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_NormalSmile -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_NormalSmile">
17160       <rdf:type rdf:resource="&cameraontology;SmileShutter"/>
        <rdfs:label xml:lang="en">Normal Smile</rdfs:label>
        <rdfs:comment xml:lang="en">The Smile Shutter: &apos;Normal Smile&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
17165


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_OnlyMovie -->

17170   <owl:NamedIndividual rdf:about="&cameraontology;SS_OnlyMovie">
        <rdf:type rdf:resource="&cameraontology;SteadyShot"/>
        <rdfs:label xml:lang="en">Only Movie</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Only for Movie SteadyShot.</rdfs:comment>
17175   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Optical -->
```

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17180
    <owl:NamedIndividual rdf:about="&cameraontology;SS_Optical">
        <rdf:type rdf:resource="&cameraontology;SteadyShot"/>
        <rdfs:label xml:lang="en">Optical</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17185   <rdfs:comment xml:lang="en">Optical SteadyShot.</rdfs:comment>
    </owl:NamedIndividual>


17190
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Party -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_Party">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Party</rdfs:label>
17195   <rdfs:comment xml:lang="en">The Scene Selection: &apos;Party&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


17200
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Pet -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_Pet">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
17205   <rdfs:label xml:lang="en">Pet</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Pet&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

17210

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Portrait -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_Portrait">
17215       <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Portrait</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Portrait&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
17220

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_SlightSmile -->

17225   <owl:NamedIndividual rdf:about="&cameraontology;SS_SlightSmile">
        <rdf:type rdf:resource="&cameraontology;SmileShutter"/>
        <rdfs:label xml:lang="en">Slight Smile</rdfs:label>
        <rdfs:comment xml:lang="en">The Smile Shutter: &apos;Slight Smile&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
17230   </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Snow -->
17235
    <owl:NamedIndividual rdf:about="&cameraontology;SS_Snow">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Snow</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Snow&apos;.</rdfs:comment>
17240   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


17245
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_SoftSkin -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_SoftSkin">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Soft Skin</rdfs:label>
17250   <rdfs:comment xml:lang="en">The Scene Selection: &apos;Soft Skin&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


17255
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_SoftSnap -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_SoftSnap">
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        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Soft Snap</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Soft Snap&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_SportsAction -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_SportsAction">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Sports Action</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Sports Action&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Sunset -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_Sunset">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Sunset</rdfs:label>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Sunset&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SS_Underwater -->

    <owl:NamedIndividual rdf:about="&cameraontology;SS_Underwater">
        <rdf:type rdf:resource="&cameraontology;SceneSelection"/>
        <rdfs:label xml:lang="en">Underwater</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Scene Selection: &apos;Underwater&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_AAS -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_AAS">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">AAS</rdfs:label>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;AAS&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_AC_GVA -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_AC_GVA">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">AC_GVA</rdfs:label>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;AC_GVA&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_AIS -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_AIS">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">AIS</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;AIS&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_CS -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_CS">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">CS</rdfs:label>
```

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        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;CS&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_IAS -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_IAS">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">IAS</rdfs:label>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;IAS&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_MIS -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_MIS">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">MIS</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;MIS&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_SAT -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_SAT">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">SAT</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;SAT&apos;.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#ST_SAT2 -->

    <owl:NamedIndividual rdf:about="&cameraontology;ST_SAT2">
        <rdf:type rdf:resource="&cameraontology;ShoeType"/>
        <rdfs:label xml:lang="en">SAT2</rdfs:label>
        <rdfs:comment xml:lang="en">The Shoe Type: &apos;SAT2&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#S_SlowZoom -->

    <owl:NamedIndividual rdf:about="&cameraontology;S_SlowZoom">
        <rdf:type rdf:resource="&cameraontology;Switch"/>
        <rdfs:label xml:lang="en">Slow Zoom</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Slow Zoom.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#VFDT_LCD -->

    <owl:NamedIndividual rdf:about="&cameraontology;VFDT_LCD">
        <rdfs:label xml:lang="en">LCD</rdfs:label>
        <rdfs:comment xml:lang="en">Liquid Crystal Display.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#VFDT_OLED -->

    <owl:NamedIndividual rdf:about="&cameraontology;VFDT_OLED">
        <rdfs:label xml:lang="en">OLED</rdfs:label>
        <rdfs:comment xml:lang="en">Organic Light Emitting Diode.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Auto -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Auto">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Auto</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Automatic White Balance.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Cloudy -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Cloudy">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Cloudy</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Cloudy White Balance.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_ColorTemperature -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_ColorTemperature">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Color Temperature</rdfs:label>
        <rdfs:comment xml:lang="en">Color Temperature White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_ColorTemperatureFilter -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_ColorTemperatureFilter">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Color Temperature Filter</rdfs:label>
        <rdfs:comment xml:lang="en">Color Temperature Filter White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Custom -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Custom">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Custom</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Custom White Balance.</rdfs:comment>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Custom_1_2_3 -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Custom_1_2_3">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Custom 123</rdfs:label>
        <rdfs:comment xml:lang="en">Custom White Balance. See Fluorescent 123 for an explaination of
↪   &apos;123&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_DayLight -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_DayLight">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Daylight</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Daylight White Balance.</rdfs:comment>
    </owl:NamedIndividual>
```

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17495
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Flash -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Flash">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
17500   <rdfs:label xml:lang="en">Flash</rdfs:label>
        <rdfs:comment xml:lang="en">Flash White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

17505

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Fluorescent -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Fluorescent">
17510   <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Fluorescent</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Fluorescent White Balance.</rdfs:comment>
    </owl:NamedIndividual>
17515

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_FluorescentCoolWhite -->

17520   <owl:NamedIndividual rdf:about="&cameraontology;WB_FluorescentCoolWhite">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Fluorescent Cool White</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Fluorescent Cool White, White Balance.</rdfs:comment>
17525   </owl:NamedIndividual>

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_FluorescentDayLight -->
17530
    <owl:NamedIndividual rdf:about="&cameraontology;WB_FluorescentDayLight">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Fluorescent Daylight</rdfs:label>
        <rdfs:comment xml:lang="en">Fluorescent Daylight White Balance.</rdfs:comment>
17535   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

17540   <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_FluorescentDayWhite -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_FluorescentDayWhite">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Fluorescent Day White</rdfs:label>
17545   <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Fluorescent Day White, White Balance.</rdfs:comment>
    </owl:NamedIndividual>

17550
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_FluorescentWarmWhite -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_FluorescentWarmWhite">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
17555   <rdfs:label xml:lang="en">Fluorescent Warm White</rdfs:label>
        <rdfs:comment xml:lang="en">Fluorescent Warm White, White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>

17560

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Fluorescent_1_2_3 -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Fluorescent_1_2_3">
17565   <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Fluorescent 123</rdfs:label>
        <rdfs:comment xml:lang="en">123 stands for White/Natural/Daylight.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>
17570

    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Incandescent -->
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    <owl:NamedIndividual rdf:about="&cameraontology;WB_Incandescent">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Incandescent</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Incandescent White Balance.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_OnePush -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_OnePush">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">One Push</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">One Push White Balance.</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Shade -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Shade">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Shade</rdfs:label>
        <rdfs:comment xml:lang="en">Shade White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_Shift -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_Shift">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Shift</rdfs:label>
        <rdfs:comment xml:lang="en">Shift White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_UnderWaterAuto -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_UnderWaterAuto">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Underwater Auto</rdfs:label>
        <rdfs:comment xml:lang="en">Underwater Automatic White Balance.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#WB_UnderWater_1_2 -->

    <owl:NamedIndividual rdf:about="&cameraontology;WB_UnderWater_1_2">
        <rdf:type rdf:resource="&cameraontology;WhiteBalance"/>
        <rdfs:label xml:lang="en">Underwater 12</rdfs:label>
       <rdfs:comment xml:lang="en">Underwater 12 White Balance. See Fluorescent 123 for an explaination about 12.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/1.3 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/1.3">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/1.3</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/1.3&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/2.3"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/2.3 -->
```

```
    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/2.3">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/2.3</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/2.3&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/2.88"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/2.88 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/2.88">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/2.88</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/2.88&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/2.9"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/2.9 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/2.9">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/2.9</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/2.9&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/3"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/3 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/3">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/3</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/3&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/3.1"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/3.1 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/3.1">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/3.1</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/3.1&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/3.91"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/3.91 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/3.91">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/3.91</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/3.91&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/4"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/4 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/4">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/4</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/4&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/5"/>
    </owl:NamedIndividual>
```

```
    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/5 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/5">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/5</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/5&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <gr:greater rdf:resource="&cameraontology;SF_1/5.8"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/5.8 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/5.8">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/5.8</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/5.8&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/6"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/6 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/6">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/6</rdfs:label>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/6&apos;.</rdfs:comment>
        <gr:greater rdf:resource="&cameraontology;SF_1/8"/>
    </owl:NamedIndividual>


    <!-- http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#SF_1/8 -->

    <owl:NamedIndividual rdf:about="&cameraontology;SF_1/8">
        <rdf:type rdf:resource="&cameraontology;SensorFormat"/>
        <rdfs:label xml:lang="en">1/8</rdfs:label>
        <rdfs:comment xml:lang="en">The Sensor Format: &apos;1/8&apos;.</rdfs:comment>
        <rdfs:isDefinedBy>http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WAA090001 -->

    <owl:NamedIndividual rdf:about="&eco;V_WAA090001">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">Other</rdfs:label>
        <rdfs:comment xml:lang="en">Other (Camera Construction Form).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:NamedIndividual>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WPA298003 -->

    <owl:NamedIndividual rdf:about="&eco;V_WPA298003">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">Reflex camera</rdfs:label>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Reflex camera (Camera Construction Form).</rdfs:comment>
    </owl:NamedIndividual>


    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WPA299003 -->

    <owl:NamedIndividual rdf:about="&eco;V_WPA299003">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">Digital reflex camera</rdfs:label>
        <rdfs:comment xml:lang="en">Digital reflex camera (Camera Construction Form).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
```

```
    </owl:NamedIndividual>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WPA300003 -->

    <owl:NamedIndividual rdf:about="&eco;V_WPA300003">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">View finder camera</rdfs:label>
        <rdfs:comment xml:lang="en">View finder camera (Camera Construction Form).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WPA301003 -->

    <owl:NamedIndividual rdf:about="&eco;V_WPA301003">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">Digital view finder camera</rdfs:label>
        <rdfs:comment xml:lang="en">Digital view finder camera (Camera Construction Form).</rdfs:comment>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
    </owl:NamedIndividual>



    <!-- http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#V_WPA302003 -->

    <owl:NamedIndividual rdf:about="&eco;V_WPA302003">
        <rdf:type rdf:resource="&cameraontology;CameraType"/>
        <rdfs:label xml:lang="en">Automatic focus camera</rdfs:label>
        <rdfs:isDefinedBy>http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/</rdfs:isDefinedBy>
        <rdfs:comment xml:lang="en">Automatic focus camera (Camera Construction Form).</rdfs:comment>
    </owl:NamedIndividual>
    <rdf:Description>
        <foaf:homepage rdf:resource="&cameraontology;CameraOntology"/>
    </rdf:Description>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Annotations
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->

    <rdf:Description rdf:about="&dcterms;Agent">
        <rdfs:label xml:lang="en">Agent</rdfs:label>
        <rdfs:comment xml:lang="en">A resource that acts or has the power to act.

Examples of Agent include person, organization, and software agent.</rdfs:comment>
        <rdfs:isDefinedBy>http://purl.org/dc/terms/</rdfs:isDefinedBy>
    </rdf:Description>
    <rdf:Description rdf:about="&owl;backwardCompatibleWith">
        <rdfs:label xml:lang="en">backward compatible with</rdfs:label>
    </rdf:Description>
    <rdf:Description rdf:about="&owl;priorVersion">
        <rdfs:label xml:lang="en">prior version</rdfs:label>
    </rdf:Description>
    <rdf:Description rdf:about="&owl;incompatibleWith">
        <rdfs:label xml:lang="en">incompatible with</rdfs:label>
    </rdf:Description>



    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // General axioms
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->

    <rdf:Description>
        <rdf:type rdf:resource="&owl;AllDifferent"/>
        <owl:distinctMembers rdf:parseType="Collection">
            <rdf:Description rdf:about="&cameraontology;G_Female"/>
```

```
            <rdf:Description rdf:about="&cameraontology;G_Male"/>
        </owl:distinctMembers>
    </rdf:Description>


    <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    // Rules
    //
    ///////////////////////////////////////////////////////////////////////////////////////
     -->

    <rdf:Description rdf:about="urn:swrl#fa">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#lta">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#ltav">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#c">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#ltc">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#ltcv">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#mt">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#ma">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#f">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#ft">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#lt">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#tla">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#tlb">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#l">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#fl">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#flt">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#t">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#b">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#bc">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#bcf">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#cn">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#cnf">
        <rdf:type rdf:resource="&swrl;Variable"/>
```

```
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#flw">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#s">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#m">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#sst">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#sb">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#sa">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#st">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#fltv">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#falt">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#faltv">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#w">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#swv">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#cw">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description rdf:about="urn:swrl#cwv">
        <rdf:type rdf:resource="&swrl;Variable"/>
    </rdf:Description>
    <rdf:Description>
        <rdf:type rdf:resource="&swrl;Imp"/>
        <swrl:head>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
                <rdf:rest rdf:resource="&rdf;nil"/>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                        <swrl:propertyPredicate rdf:resource="&cameraontology;isIndirectLensCameraInterfaceOf"/>
                        <swrl:argument1 rdf:resource="urn:swrl#l"/>
                        <swrl:argument2 rdf:resource="urn:swrl#ma"/>
                    </rdf:Description>
                </rdf:first>
            </rdf:Description>
        </swrl:head>
        <swrl:body>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                        <swrl:propertyPredicate rdf:resource="&cameraontology;accessoryInterfaceMount"/>
                        <swrl:argument1 rdf:resource="urn:swrl#ma"/>
                        <swrl:argument2 rdf:resource="urn:swrl#mt"/>
                    </rdf:Description>
                </rdf:first>
                <rdf:rest>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;AtomList"/>
                        <rdf:first>
                            <rdf:Description>
                                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                <swrl:propertyPredicate rdf:resource="&cameraontology;cameraInterfaceMount"/>
                                <swrl:argument1 rdf:resource="urn:swrl#l"/>
                                <swrl:argument2 rdf:resource="urn:swrl#mt"/>
```

```
                        </rdf:Description>
                    </rdf:first>
                    <rdf:rest>
                        <rdf:Description>
                            <rdf:type rdf:resource="&swrl;AtomList"/>
                            <rdf:first>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                    <swrl:classPredicate rdf:resource="&eco;C_AKN891002-gen"/>
                                    <swrl:argument1 rdf:resource="urn:swrl#l"/>
                                </rdf:Description>
                            </rdf:first>
                            <rdf:rest>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;AtomList"/>
                                    <rdf:rest rdf:resource="&rdf;nil"/>
                                    <rdf:first>
                                        <rdf:Description>
                                            <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                            <swrl:classPredicate rdf:resource="&cameraontology;MountAdapterGeneric"/>
                                            <swrl:argument1 rdf:resource="urn:swrl#ma"/>
                                        </rdf:Description>
                                    </rdf:first>
                                </rdf:Description>
                            </rdf:rest>
                        </rdf:Description>
                    </rdf:rest>
                </rdf:Description>
            </rdf:rest>
        </rdf:Description>
    </swrl:body>
</rdf:Description>
<rdf:Description>
    <rdf:type rdf:resource="&swrl;Imp"/>
    <swrl:body>
        <rdf:Description>
            <rdf:type rdf:resource="&swrl;AtomList"/>
            <rdf:rest>
                <rdf:Description>
                    <rdf:type rdf:resource="&swrl;AtomList"/>
                    <rdf:rest>
                        <rdf:Description>
                            <rdf:type rdf:resource="&swrl;AtomList"/>
                            <rdf:rest>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;AtomList"/>
                                    <rdf:rest rdf:resource="&rdf;nil"/>
                                    <rdf:first>
                                        <rdf:Description>
                                            <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                            <swrl:classPredicate rdf:resource="&eco;C_AKN884002-gen"/>
                                            <swrl:argument1 rdf:resource="urn:swrl#c"/>
                                        </rdf:Description>
                                    </rdf:first>
                                </rdf:Description>
                            </rdf:rest>
                            <rdf:first>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                    <swrl:classPredicate rdf:resource="&cameraontology;ShoeAdapterGeneric"/>
                                    <swrl:argument1 rdf:resource="urn:swrl#sb"/>
                                </rdf:Description>
                            </rdf:first>
                        </rdf:Description>
                    </rdf:rest>
                    <rdf:first>
                        <rdf:Description>
                            <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                            <swrl:propertyPredicate rdf:resource="&cameraontology;cameraInterfaceShoe"/>
                            <swrl:argument1 rdf:resource="urn:swrl#sb"/>
                            <swrl:argument2 rdf:resource="urn:swrl#sst"/>
                        </rdf:Description>
                    </rdf:first>
                </rdf:Description>
            </rdf:rest>
            <rdf:first>
                <rdf:Description>
                    <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                    <swrl:propertyPredicate rdf:resource="&cameraontology;accessoryInterfaceShoe"/>
```

```
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                                        <rdf:type rdf:resource="&swrl;AtomList"/>
                                        <rdf:rest rdf:resource="&rdf;nil"/>
                                        <rdf:first>
                                            <rdf:Description>
                                                <rdf:type rdf:resource="&swrl;BuiltinAtom"/>
                                                <swrl:builtin rdf:resource="&swrlb;greaterThanOrEqual"/>
                                                <swrl:arguments>
                                                    <rdf:Description>
                                                        <rdf:type rdf:resource="&rdf;List"/>
                                                        <rdf:first rdf:resource="urn:swrl#flt"/>
                                                        <rdf:rest>
                                                            <rdf:Description>
                                                                <rdf:type rdf:resource="&rdf;List"/>
                                                                <rdf:first rdf:datatype="&xsd;decimal">135.0</rdf:first>
                                                                <rdf:rest rdf:resource="&rdf;nil"/>
                                                            </rdf:Description>
                                                        </rdf:rest>
                                                    </rdf:Description>
                                                </swrl:arguments>
                                            </rdf:Description>
                                        </rdf:first>
                                    </rdf:Description>
                                </rdf:rest>
                            </rdf:Description>
                        </rdf:rest>
                        <rdf:first>
                            <rdf:Description>
                                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                <swrl:propertyPredicate rdf:resource="&cameraontology;focalLength"/>
                                <swrl:argument2 rdf:resource="urn:swrl#fl"/>
                                <swrl:argument1 rdf:resource="urn:swrl#l"/>
                            </rdf:Description>
                        </rdf:first>
                    </rdf:Description>
                </rdf:rest>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;ClassAtom"/>
                        <swrl:classPredicate rdf:resource="&eco;C_AKN891002-gen"/>
                        <swrl:argument1 rdf:resource="urn:swrl#l"/>
                    </rdf:Description>
                </rdf:first>
            </rdf:Description>
        </swrl:body>
    </rdf:Description>
    <rdf:Description>
        <rdf:type rdf:resource="&swrl;Imp"/>
        <swrl:head>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
                <rdf:rest rdf:resource="&rdf;nil"/>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                        <swrl:propertyPredicate rdf:resource="&cameraontology;isDirectFilterOf"/>
                        <swrl:argument2 rdf:resource="urn:swrl#c"/>
                        <swrl:argument1 rdf:resource="urn:swrl#f"/>
                    </rdf:Description>
                </rdf:first>
            </rdf:Description>
        </swrl:head>
        <swrl:body>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
```

```
                <rdf:rest>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;AtomList"/>
                        <rdf:first>
19310                       <rdf:Description>
                                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                <swrl:propertyPredicate rdf:resource="&cameraontology;accessoryInterfaceLensThread"/>
                                <swrl:argument1 rdf:resource="urn:swrl#c"/>
                                <swrl:argument2 rdf:resource="urn:swrl#lt"/>
19315                       </rdf:Description>
                        </rdf:first>
                        <rdf:rest>
                            <rdf:Description>
                                <rdf:type rdf:resource="&swrl;AtomList"/>
19320                           <rdf:first>
                                    <rdf:Description>
                                        <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                                        <swrl:propertyPredicate rdf:resource="&gr;hasValueInteger"/>
                                        <swrl:argument1 rdf:resource="urn:swrl#ft"/>
19325                                   <swrl:argument2 rdf:resource="urn:swrl#tla"/>
                                    </rdf:Description>
                                </rdf:first>
                                <rdf:rest>
                                    <rdf:Description>
19330                                   <rdf:type rdf:resource="&swrl;AtomList"/>
                                        <rdf:first>
                                            <rdf:Description>
                                                <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                                                <swrl:propertyPredicate rdf:resource="&gr;hasValueInteger"/>
19335                                           <swrl:argument1 rdf:resource="urn:swrl#lt"/>
                                                <swrl:argument2 rdf:resource="urn:swrl#tlb"/>
                                            </rdf:Description>
                                        </rdf:first>
                                        <rdf:rest>
19340                                       <rdf:Description>
                                                <rdf:type rdf:resource="&swrl;AtomList"/>
                                                <rdf:first>
                                                    <rdf:Description>
                                                        <rdf:type rdf:resource="&swrl;BuiltinAtom"/>
19345                                                   <swrl:builtin rdf:resource="&swrlb;equal"/>
                                                        <swrl:arguments rdf:parseType="Collection">
                                                            <rdf:Description rdf:about="urn:swrl#tla"/>
                                                            <rdf:Description rdf:about="urn:swrl#tlb"/>
                                                        </swrl:arguments>
19350                                               </rdf:Description>
                                                </rdf:first>
                                                <rdf:rest>
                                                    <rdf:Description>
                                                        <rdf:type rdf:resource="&swrl;AtomList"/>
19355                                                   <rdf:rest>
                                                            <rdf:Description>
                                                                <rdf:type rdf:resource="&swrl;AtomList"/>
                                                                <rdf:rest rdf:resource="&rdf;nil"/>
                                                                <rdf:first>
19360                                                               <rdf:Description>
                                                                        <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                                                      <swrl:classPredicate rdf:resource="&eco;C_AKN884002-gen"/>
                                                                        <swrl:argument1 rdf:resource="urn:swrl#c"/>
                                                                    </rdf:Description>
19365                                                           </rdf:first>
                                                            </rdf:Description>
                                                        </rdf:rest>
                                                        <rdf:first>
                                                            <rdf:Description>
19370                                                           <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                                                <swrl:classPredicate rdf:resource="&eco;C_AKN892002-gen"/>
                                                                <swrl:argument1 rdf:resource="urn:swrl#f"/>
                                                            </rdf:Description>
                                                        </rdf:first>
19375                                               </rdf:Description>
                                                </rdf:rest>
                                            </rdf:Description>
                                        </rdf:rest>
                                    </rdf:Description>
19380                           </rdf:rest>
                            </rdf:Description>
                        </rdf:rest>
                    </rdf:Description>
                </rdf:rest>
```

```
19385                <rdf:first>
                         <rdf:Description>
                             <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                             <swrl:propertyPredicate rdf:resource="&cameraontology;lensInterfaceLensThread"/>
                             <swrl:argument1 rdf:resource="urn:swrl#f"/>
19390                        <swrl:argument2 rdf:resource="urn:swrl#ft"/>
                         </rdf:Description>
                     </rdf:first>
                 </rdf:Description>
             </swrl:body>
19395    </rdf:Description>
         <rdf:Description>
             <rdf:type rdf:resource="&swrl;Imp"/>
             <swrl:body>
                 <rdf:Description>
19400                <rdf:type rdf:resource="&swrl;AtomList"/>
                     <rdf:rest>
                         <rdf:Description>
                             <rdf:type rdf:resource="&swrl;AtomList"/>
                             <rdf:rest>
19405                            <rdf:Description>
                                     <rdf:type rdf:resource="&swrl;AtomList"/>
                                     <rdf:first>
                                         <rdf:Description>
                                             <rdf:type rdf:resource="&swrl;ClassAtom"/>
19410                                        <swrl:classPredicate rdf:resource="&cameraontology;ShoeAdapterGeneric"/>
                                             <swrl:argument1 rdf:resource="urn:swrl#sa"/>
                                         </rdf:Description>
                                     </rdf:first>
                                     <rdf:rest>
19415                                    <rdf:Description>
                                             <rdf:type rdf:resource="&swrl;AtomList"/>
                                             <rdf:rest rdf:resource="&rdf;nil"/>
                                             <rdf:first>
                                                 <rdf:Description>
19420                                                <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                                     <swrl:classPredicate rdf:resource="&eco;C_AKN888002-gen"/>
                                                     <swrl:argument1 rdf:resource="urn:swrl#f"/>
                                                 </rdf:Description>
                                             </rdf:first>
19425                                    </rdf:Description>
                                     </rdf:rest>
                                 </rdf:Description>
                             </rdf:rest>
                             <rdf:first>
19430                            <rdf:Description>
                                     <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                     <swrl:propertyPredicate rdf:resource="&cameraontology;cameraInterfaceShoe"/>
                                     <swrl:argument1 rdf:resource="urn:swrl#f"/>
                                     <swrl:argument2 rdf:resource="urn:swrl#st"/>
19435                            </rdf:Description>
                             </rdf:first>
                         </rdf:Description>
                     </rdf:rest>
                     <rdf:first>
19440                    <rdf:Description>
                             <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                             <swrl:propertyPredicate rdf:resource="&cameraontology;accessoryInterfaceShoe"/>
                             <swrl:argument1 rdf:resource="urn:swrl#sa"/>
                             <swrl:argument2 rdf:resource="urn:swrl#st"/>
19445                    </rdf:Description>
                     </rdf:first>
                 </rdf:Description>
             </swrl:body>
             <swrl:head>
19450            <rdf:Description>
                     <rdf:type rdf:resource="&swrl;AtomList"/>
                     <rdf:rest rdf:resource="&rdf;nil"/>
                     <rdf:first>
                         <rdf:Description>
19455                    <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                         <swrl:propertyPredicate rdf:resource="&cameraontology;isIndirectFlashCameraInterfaceOf"/>
                         <swrl:argument2 rdf:resource="urn:swrl#f"/>
                         <swrl:argument1 rdf:resource="urn:swrl#sa"/>
                     </rdf:Description>
19460            </rdf:first>
             </rdf:Description>
         </swrl:head>
     </rdf:Description>
```

```
    <rdf:Description>
        <rdf:type rdf:resource="&swrl;Imp"/>
        <swrl:head>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
                <rdf:rest rdf:resource="&rdf;nil"/>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;ClassAtom"/>
                        <swrl:classPredicate rdf:resource="&cameraontology;FixedFocusLensGeneric"/>
                        <swrl:argument1 rdf:resource="urn:swrl#l"/>
                    </rdf:Description>
                </rdf:first>
            </rdf:Description>
        </swrl:head>
        <swrl:body>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;AtomList"/>
                <rdf:rest>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;AtomList"/>
                        <rdf:first>
                            <rdf:Description>
                                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                <swrl:propertyPredicate rdf:resource="&cameraontology;focalLength"/>
                                <swrl:argument2 rdf:resource="urn:swrl#fl"/>
                                <swrl:argument1 rdf:resource="urn:swrl#l"/>
                            </rdf:Description>
                        </rdf:first>
                        <rdf:rest>
                            <rdf:Description>
                                <rdf:type rdf:resource="&swrl;AtomList"/>
                                <rdf:first>
                                    <rdf:Description>
                                        <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                                        <swrl:propertyPredicate rdf:resource="&gr;hasMinValueFloat"/>
                                        <swrl:argument1 rdf:resource="urn:swrl#fl"/>
                                        <swrl:argument2 rdf:resource="urn:swrl#flw"/>
                                    </rdf:Description>
                                </rdf:first>
                                <rdf:rest>
                                    <rdf:Description>
                                        <rdf:type rdf:resource="&swrl;AtomList"/>
                                        <rdf:rest>
                                            <rdf:Description>
                                                <rdf:type rdf:resource="&swrl;AtomList"/>
                                                <rdf:rest rdf:resource="&rdf;nil"/>
                                                <rdf:first>
                                                    <rdf:Description>
                                                        <rdf:type rdf:resource="&swrl;BuiltinAtom"/>
                                                        <swrl:builtin rdf:resource="&swrlb;equal"/>
                                                        <swrl:arguments rdf:parseType="Collection">
                                                            <rdf:Description rdf:about="urn:swrl#flw"/>
                                                            <rdf:Description rdf:about="urn:swrl#flt"/>
                                                        </swrl:arguments>
                                                    </rdf:Description>
                                                </rdf:first>
                                            </rdf:Description>
                                        </rdf:rest>
                                        <rdf:first>
                                            <rdf:Description>
                                                <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                                                <swrl:propertyPredicate rdf:resource="&gr;hasMaxValueFloat"/>
                                                <swrl:argument1 rdf:resource="urn:swrl#fl"/>
                                                <swrl:argument2 rdf:resource="urn:swrl#flt"/>
                                            </rdf:Description>
                                        </rdf:first>
                                    </rdf:Description>
                                </rdf:rest>
                            </rdf:Description>
                        </rdf:rest>
                    </rdf:Description>
                </rdf:rest>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;ClassAtom"/>
                        <swrl:classPredicate rdf:resource="&eco;C_AKN891002-gen"/>
                        <swrl:argument1 rdf:resource="urn:swrl#l"/>
                    </rdf:Description>
```

```
            </rdf:first>
        </rdf:Description>
    </swrl:body>
</rdf:Description>
<rdf:Description>
    <rdf:type rdf:resource="&swrl;Imp"/>
    <swrl:body>
        <rdf:Description>
            <rdf:type rdf:resource="&swrl;AtomList"/>
            <rdf:first>
                <rdf:Description>
                    <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                    <swrl:propertyPredicate rdf:resource="&cameraontology;maximumSupportedWeight"/>
                    <swrl:argument1 rdf:resource="urn:swrl#t"/>
                    <swrl:argument2 rdf:resource="urn:swrl#w"/>
                </rdf:Description>
            </rdf:first>
            <rdf:rest>
                <rdf:Description>
                    <rdf:type rdf:resource="&swrl;AtomList"/>
                    <rdf:rest>
                        <rdf:Description>
                            <rdf:type rdf:resource="&swrl;AtomList"/>
                            <rdf:first>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                                    <swrl:propertyPredicate rdf:resource="&s;weight"/>
                                    <swrl:argument1 rdf:resource="urn:swrl#c"/>
                                    <swrl:argument2 rdf:resource="urn:swrl#cw"/>
                                </rdf:Description>
                            </rdf:first>
                            <rdf:rest>
                                <rdf:Description>
                                    <rdf:type rdf:resource="&swrl;AtomList"/>
                                    <rdf:rest>
                                        <rdf:Description>
                                            <rdf:type rdf:resource="&swrl;AtomList"/>
                                            <rdf:first>
                                                <rdf:Description>
                                                    <rdf:type rdf:resource="&swrl;BuiltinAtom"/>
                                                    <swrl:builtin rdf:resource="&swrlb;lessThanOrEqual"/>
                                                    <swrl:arguments rdf:parseType="Collection">
                                                        <rdf:Description rdf:about="urn:swrl#cwv"/>
                                                        <rdf:Description rdf:about="urn:swrl#swv"/>
                                                    </swrl:arguments>
                                                </rdf:Description>
                                            </rdf:first>
                                            <rdf:rest>
                                                <rdf:Description>
                                                    <rdf:type rdf:resource="&swrl;AtomList"/>
                                                    <rdf:first>
                                                        <rdf:Description>
                                                            <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                                            <swrl:classPredicate rdf:resource="&eco;C_AKN884002-gen"/>
                                                            <swrl:argument1 rdf:resource="urn:swrl#c"/>
                                                        </rdf:Description>
                                                    </rdf:first>
                                                    <rdf:rest>
                                                        <rdf:Description>
                                                            <rdf:type rdf:resource="&swrl;AtomList"/>
                                                            <rdf:rest rdf:resource="&rdf;nil"/>
                                                            <rdf:first>
                                                                <rdf:Description>
                                                                    <rdf:type rdf:resource="&swrl;ClassAtom"/>
                                                                  <swrl:classPredicate rdf:resource="&eco;C_AKN889002-gen"/>
                                                                    <swrl:argument1 rdf:resource="urn:swrl#t"/>
                                                                </rdf:Description>
                                                            </rdf:first>
                                                        </rdf:Description>
                                                    </rdf:rest>
                                                </rdf:Description>
                                            </rdf:rest>
                                        </rdf:Description>
                                    </rdf:rest>
                                    <rdf:first>
                                        <rdf:Description>
                                            <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                                            <swrl:propertyPredicate rdf:resource="&gr;hasValueFloat"/>
                                            <swrl:argument1 rdf:resource="urn:swrl#cw"/>
```

```
                                        <swrl:argument2 rdf:resource="urn:swrl#cwv"/>
                                    </rdf:Description>
                                </rdf:first>
                            </rdf:Description>
                        </rdf:rest>
                    </rdf:Description>
                </rdf:rest>
                <rdf:first>
                    <rdf:Description>
                        <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
                        <swrl:propertyPredicate rdf:resource="&gr;hasValueFloat"/>
                        <swrl:argument2 rdf:resource="urn:swrl#swv"/>
                        <swrl:argument1 rdf:resource="urn:swrl#w"/>
                    </rdf:Description>
                </rdf:first>
            </rdf:Description>
        </rdf:rest>
    </rdf:Description>
</swrl:body>
<swrl:head>
    <rdf:Description>
        <rdf:type rdf:resource="&swrl;AtomList"/>
        <rdf:rest rdf:resource="&rdf;nil"/>
        <rdf:first>
            <rdf:Description>
                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                <swrl:propertyPredicate rdf:resource="&cameraontology;isTripodOf"/>
                <swrl:argument2 rdf:resource="urn:swrl#c"/>
                <swrl:argument1 rdf:resource="urn:swrl#t"/>
            </rdf:Description>
        </rdf:first>
    </rdf:Description>
</swrl:head>
</rdf:Description>
</rdf:RDF>



<!-- Generated by the OWL API (version 3.5.1) http://owlapi.sourceforge.net -->
```

B.3 Camera Ontology Documentation

Listing B.3: cameraontology.xhtml.

cameraontology.xhtml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en-US" lang="en-US">
  <head>
    <meta charset="UTF-8" />
    <meta name="description" content="Camera Ontology" />
    <meta name="keywords" content="ontology,master thesis,sony" />
    <meta name="author" content="Pieter Stroobants" />
    <meta name="robots" content="noindex, nofollow" />
  </head>
  <body>
    <header role="banner">
      <h1>Camera Ontology Documentation</h1>
    </header>
  </body>
</html>
```

B.4 Camera Ontology OntOlogy Pitfall Scanner! (oops!) Verification

Listing B.4: verify.xhtml.

verify.xhtml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en-US" lang="en-US">
```

```
  <head>
    <meta charset="UTF-8" />
    <title>Scanning Ontology Using OOPS ...</title>
    <style type="text/css">
      button {
        display: block;
        margin-top: 10pt;
      }
    </style>
    <script type="text/javascript" src="https://cdnjs.cloudflare.com/ajax/libs/jquery/2.1.3/jquery.min.js"></script>
    <script type="text/javascript"
  ↪    src="https://cdnjs.cloudflare.com/ajax/libs/autosize.js/1.18.17/jquery.autosize.min.js"></script>
    <script type="text/javascript" src="jquery.format.js"></script>
    <script>
      //<![CDATA[
        var ontourl = "http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology";
        var xmlreq = "<?xml version=\"1.0\" encoding=\"UTF-8\"?>"
          + "<OOPSRequest>"
          + "<OntologyUrl>"
          + ontourl
          + "</OntologyUrl>"
          + "<OntologyContent></OntologyContent>"
          + "<Pitfalls></Pitfalls>"
          + "<OutputFormat>XML</OutputFormat>"
          + "</OOPSRequest>";
        $(document).ready(function() {
        $("#result")
         .autosize()
         .on("resize", function(event) {
           $(this).trigger("autosize.resize");
         });
        $("h1").after("<h2>"
          + "<span style=\"font-variant: small-caps;\">url</span>: "
          + ontourl
          + "</h2>");
        $.ajax({
          url: "http://oops-ws.oeg-upm.net/rest",
          type: "POST",
          crossDomain: true,
          processData: false,
          data: xmlreq,
          dataType: "xml",
          success: function(data, textStatus, jqXHR) {
            $("h1").text("Result");
            $("#saveXML").removeAttr("disabled");
            $("#result")
              .removeAttr("disabled")
              .val(new XMLSerializer().serializeToString(data))
              .format({method: "xml"})
              .trigger("autosize.resize");}
          });
        $("#saveXML").click(function(event) {
          $("<a></a>")
            .attr({
              download: "result.xml",
              href: URL.createObjectURL(new Blob([$("#result").val()], {type: "text/xml"})),
              style:  "display: none;"})
            .click(function(event) {
              /* submit a native click in
               * order to start a download
               */
              $(this)[0].click();
              $(this).remove();
              })
            .appendTo("body")
            .trigger("click");
          });
        });
      //]]>
    </script>
  </head>
  <body>
    <h1>Scanning Ontology Using OOPS ...</h1>
    <textarea id="result" rows="30" cols="150" readonly="readonly" disabled="disabled"></textarea>
    <button id="saveXML" type="button" disabled="disabled">Save XML</button>
  </body>
</html>
```

B.5 Swrl Reasoner

Listing B.5: SWRLReasoner.java.

SWRLReasoner.java

```
package swrlreasoner;

import com.hp.hpl.jena.query.ARQ;
import com.hp.hpl.jena.query.Dataset;
import com.hp.hpl.jena.query.Query;
import com.hp.hpl.jena.query.QueryExecution;
import com.hp.hpl.jena.query.QueryExecutionFactory;
import com.hp.hpl.jena.query.QueryFactory;
import com.hp.hpl.jena.query.QuerySolution;
import com.hp.hpl.jena.query.ResultSet;
import com.hp.hpl.jena.rdf.model.InfModel;
import com.hp.hpl.jena.rdf.model.Model;
import com.hp.hpl.jena.rdf.model.ModelFactory;
import com.hp.hpl.jena.reasoner.Reasoner;
import com.hp.hpl.jena.sparql.mgt.Explain;
import com.hp.hpl.jena.tdb.TDBFactory;
import com.hp.hpl.jena.util.FileManager;
import java.io.IOException;
import java.net.MalformedURLException;
import java.net.URL;
import java.util.ArrayList;
import java.util.List;
import java.util.logging.Level;
import java.util.logging.Logger;
import org.mindswap.pellet.jena.PelletReasonerFactory;

/**
 *
 * @author Pieter Stroobants
 */
public class SWRLReasoner {

    private static SWRLReasoner instance;
    //private static final String BASE_URL = "http://www.semanticweb.org/pst/ontologies/2014/10/camera-ontology";
    //private static final String ECO_URL = "http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/";
    private static final String coUrl = "http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology.owl";
    private static final String tdbDirectory = "C:\\tdb";

    // In a real implementation, tdbModel should be a URI.
    private static final String tdbModel = "sony";
    private static final boolean createTdb = false;

    private static InfModel infModel;
    private static Model tdb;
    private static Dataset dataset;

    public static SWRLReasoner getInstance(){
        if(instance == null){
            instance = new SWRLReasoner();
            return instance;
        }
        else{
            return instance;
        }
    }

    /**
     * @param args the command line arguments
     * @throws java.lang.Exception
     */
    public SWRLReasoner() {
        dataset = TDBFactory.createDataset(tdbDirectory);


        if (createTdb) {
            tdb = dataset.getDefaultModel();

        String dbdump1 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\alpha.output.nt";
        String dbdump2 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\battery.output.nt";
        String dbdump3 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\cam.output.nt";
        String dbdump4 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\compact.output.nt";
        String dbdump5 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\db.output.nt";
        String dbdump6 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\flash.output.nt";
        String dbdump7 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\lens.output.nt";
```

```
        String dbdump8 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\mount.output.nt";
        String dbdump9 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\shoe.output.nt";
        String dbdump10 = "C:\\Users\\Pieter\\Dropbox\\Thesis\\tripod.output.nt";

        FileManager.get().readModel(tdb, dbdump1, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump2, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump3, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump4, "N-TRIPLES");
        //FileManager.get().readModel(tdb, dbdump5, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump6, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump7, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump8, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump9, "N-TRIPLES");
        FileManager.get().readModel(tdb, dbdump10, "N-TRIPLES");
        dataset.addNamedModel(tdbModel, tdb);
        } else {
            tdb = dataset.getNamedModel(tdbModel);
        }

        Reasoner reasoner = PelletReasonerFactory.theInstance().create();

        infModel = ModelFactory.createInfModel(reasoner, tdb);
        try {
            // 2nd argument is the base URL
            infModel.read(new URL(coUrl).openStream(), null);
        } catch (MalformedURLException ex) {
            Logger.getLogger(SWRLReasoner.class.getName()).log(Level.SEVERE, null, ex);
        } catch (IOException ex) {
            Logger.getLogger(SWRLReasoner.class.getName()).log(Level.SEVERE, null, ex);
        }

        String sparqlQueryString1 =
                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
                + "prefix gr: <http://purl.org/goodrelations/v1#> "
                + "SELECT ?l ?c  WHERE {?lens cameraontology:isDirectLensOf ?c."
                + "?lens gr:description ?l}";

        String sparqlQueryString2 =
                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
                + "prefix gr: <http://purl.org/goodrelations/v1#> "
                + "SELECT ?b ?c  WHERE {?b cameraontology:isCameraBatteryOf ?c.}";

        String sparqlQueryString
                = "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
                + "SELECT distinct ?f ?c  WHERE {?f cameraontology:isDirectFlashOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?t ?c  WHERE {?t cameraontology:isTripodOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isDirectFilterOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFilterAccessoryInterfaceOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFilterLensInterfaceOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectLensAccessoryInterfaceOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectLensCameraInterfaceOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFlashAccessoryInterfaceOf ?c.}";

//        String sparqlQueryString =
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "SELECT ?l ?c  WHERE {?l cameraontology:isIndirectFlashCameraInterfaceOf ?c.}";

//        String sparqlQueryStringDONE =
```

```
//                "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
//                + "prefix eclass: <http://www.ebusiness-unibw.org/ontologies/eclass/5.1.4/#>  "
//                + "SELECT distinct ?l  WHERE { ?l <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> "
//                + "cameraontology:FixedAngleLensGeneric.}";

    }

    public List<String[]> getCameraFittingFlashes() throws IOException{
        List<String[]> resultaat = new ArrayList<>();


        String sparqlQueryString =
            "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
            + "SELECT distinct ?b ?c  WHERE {?b cameraontology:isCameraBatteryOf ?c.}";


        List<String[]> results = getResult(sparqlQueryString,infModel,"b", "c");

        for(String[] res : results){
            System.out.println(res[0]);
            System.out.println(res[1]);
            System.out.println("-------------------------------");
        }
            resultaat = results;

        return resultaat;
    }

    public List<String[]> getCameraFittingBatteries() throws IOException{
        List<String[]> resultaat = new ArrayList<>();

        String sparqlQueryString =
            "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
            + "SELECT distinct ?f ?c  WHERE {?f cameraontology:isDirectFlashOf ?c.}";

        List<String[]> results = getResult(sparqlQueryString,infModel,"c", "f");

        for(String[] res : results){
            System.out.println(res[0]);
            System.out.println(res[1]);
            System.out.println("-------------------------------");
        }
            resultaat = results;

        return resultaat;
    }

    public List<String[]> getCameraFittingTripods() throws IOException{
        List<String[]> resultaat = new ArrayList<>();

        String sparqlQueryString =
            "prefix cameraontology: <http://wilma.vub.ac.be/~pstrooba/files/ontology/cameraontology#> "
            + "SELECT ?t ?c  WHERE {?t cameraontology:isTripodOf ?c.}";

            List<String[]> results = getResult(sparqlQueryString,infModel,"c", "t");

        for(String[] res : results){
            System.out.println(res[0]);
            System.out.println(res[1]);
            System.out.println("-------------------------------");
        }
            resultaat = results;

        return resultaat;
    }

    public List<String[]> getResult(String sparqlQueryString, InfModel infModel, String var1, String var2) {
        Query query = QueryFactory.create(sparqlQueryString);

        QueryExecution qexec = QueryExecutionFactory.create(query, infModel);
        qexec.getContext().set(ARQ.symLogExec, Explain.InfoLevel.ALL);
        ResultSet rs = qexec.execSelect();
        List<String[]> res = new ArrayList<>();

        while(rs.hasNext()){
            String[] rowResult = new String[2];
            QuerySolution row = rs.next();
            rowResult[0] = row.getResource(var1).getURI();
            rowResult[1] = row.getResource(var2).getURI();
```

```
            res.add(rowResult);
        }

        qexec.close();
        return res;
    }
}
```

APPENDIX C

LaTeX 2ε Tools

VUB Title Page Package;
VUB Thesis Class

C.1 Vub Title Page Package

Listing C.1: vubtitlepage.sty.

vubtitlepage.sty

```
% Author: Pieter Stroobants, based upon the work of
% Toon Verwaest & Thomas De Schampheleire
% Update 10 June 2015

\NeedsTeXFormat{LaTeX2e}[2011/06/27]
\ProvidesPackage{vubtitlepage}%
  [2015/06/10
   v1.6
   Title page for a thesis published at the
   `Vrije Universiteit Brussel' (VUB)]

\RequirePackage{etoolbox}

\newtoggle{vubtp@memoir}
\newtoggle{vubtp@englishlang}

\@ifclassloaded{memoir}%
  {\toggletrue{vubtp@memoir}}%
  {\RequirePackage{ifxetex}
   \RequirePackage{textcase}}

% This package requires XeTeX
\RequireXeTeX

% Package Constants
\newcommand*{\vubtp@defaultfont}%
  {Latin Modern Sans}

\RequirePackage{kvoptions}
\RequirePackage{graphicx}
\RequirePackage{xcolor}
\RequirePackage{fontspec}
\RequirePackage{tikz}
\RequirePackage%
  [absolute,overlay]%
  {textpos}

\SetupKeyvalOptions%
  {family=vubtp,
   prefix=vubtp@}

% Global Options
\DeclareBoolOption%
  [false]%
  {draft}
\DeclareComplementaryOption%
  {final}%
  {draft}

% Local Options
\DeclareStringOption%
  [\vubtp@defaultfont]%
  {font}%
  [\vubtp@defaultfont]
\DeclareBoolOption%
  [true]%
  {officialsubformat}
\DeclareBoolOption%
  [false]%
  {research}
\DeclareBoolOption%
  [false]%
  {altshield}
\DeclareBoolOption%
  [false]%
  {longtitle}
\DeclareComplementaryOption%
  {customsubformat}%
  {officialsubformat}

\DeclareLocalOptions%
  {font,
   officialsubformat,
   customsubformat,
```

```
    research,
    altshield,
    longtitle}

% Unrecognized Options
% We need the macro `\ifundef' because we need
% to test for \relax as well, i.e. if there is
% no `CurrentOptionValue' this macro is set to
% `relax' and `\ifdef' can not test this.
\DeclareDefaultOption%
  {\PackageWarningNoLine{vubtitlepage}%
     {Unknown option `\CurrentOptionKey'\MessageBreak%
      \ifundef{\CurrentOptionValue}%
        {}%
        {with value `\CurrentOptionValue'\MessageBreak}%
      is passed to package `vubtitlepage'}}

\ProcessKeyvalOptions*

\definecolor{vubtp@drafttextcolor}%
  {gray}%
  {.8}

% Non language specific defaults
\newcommand*{\vubtp@year}%
  {\number\year}
\newcommand*{\vubtp@baseskipmultiplier}%
  {1.2}
\newcommand*{\vubtp@titledelimiter}%
  {:}

\@ifpackageloaded{polyglossia}%
  {\ifcsdef{xpg@main@language}%
     {\ifcsstring{xpg@main@language}{english}%
        {\toggletrue{vubtp@englishlang}}%
        {}}%
     {\PackageWarning{vubtitlepage}%
        {`polyglossia' loaded\MessageBreak%
         but default language not set\MessageBreak%
         - defaulting to dutch}}}%
  {\@ifpackageloaded{babel}%
     % If package `babel' is loaded, then a main
     % language must be specified.
     % Otherwise `babel' throws an error.
     {\renewcommand*{\do}[1]%
        {\ifcsstring{bbl@main@language}{#1}%
           {\toggletrue{vubtp@englishlang}}%
           {}}
      \docsvlist{english,USenglish,american,UKenglish,british,
                 canadian,australian,newzealand}}%
     {}}

% Language specific defaults
\iftoggle{vubtp@englishlang}%
  {\newcommand*{\vubtp@month}%
     {\ifcase\month%
        \or January%
        \or February%
        \or March%
        \or April%
        \or May%
        \or June%
        \or July%
        \or August%
        \or September%
        \or October%
        \or November%
        \or December%
      \fi}
   \newcommand*{\vubtp@promotortitle}%
     {Set promotor title}
   \newcommand*{\vubtp@advisortitle}%
     {Set advisor title}
   \newcommand*{\vubtp@promotor}%
     {Set promotor}
   \newcommand*{\vubtp@advisor}%
     {Set advisor}
   \newcommand*{\vubtp@faculty}%
     {Set faculty}
```

```
    \newcommand*{\vubtp@department}%
      {Set department}
    \newcommand*{\vubtp@researchgroup}%
      {Set research group}
    \newcommand*{\vubtp@reason}%
      {Set reason}
    \newcommand*{\vubtp@academicyear}%
      {Set academic year}
    \newcommand*{\vubtp@academicyeartitle}%
      {Set academic year title}
    \newcommand*{\vubtp@submissiondatetitle}%
      {Set submission title}
    \newcommand*{\vubtp@drafttext}%
      {DRAFT}}%
   {\newcommand*{\vubtp@month}%
      {\ifcase\month%
         \or januari%
         \or februari%
         \or maart%
         \or april%
         \or mei%
         \or juni%
         \or juli%
         \or augustus%
         \or september%
         \or oktober%
         \or november%
         \or december%
       \fi}
    \newcommand*{\vubtp@promotortitle}%
      {Geef promotor titel}
    \newcommand*{\vubtp@advisortitle}%
      {Geef advisor titel}
    \newcommand*{\vubtp@promotor}%
      {Geef promotor}
    \newcommand*{\vubtp@advisor}%
      {Geef advisor}
    \newcommand*{\vubtp@faculty}%
      {Geef faculeit}
    \newcommand*{\vubtp@department}%
      {Geef departement}
    \newcommand*{\vubtp@researchgroup}%
      {Geef research groep}
    \newcommand*{\vubtp@reason}%
      {Geef rede}
    \newcommand*{\vubtp@academicyear}%
      {Geef academiejaar}
    \newcommand*{\vubtp@academicyeartitle}%
      {Geef academiejaar titel}
    \newcommand*{\vubtp@submissiondatetitle}%
      {Geef indiendatum titel}
    \newcommand*{\vubtp@drafttext}%
      {ONTWERP}}

% User Interface
\newcommand*{\vubtpauthor}[1]%
  {\author{#1}}
\newcommand*{\vubtptitle}[1]%
  {\title{#1}}
\newcommand*{\vubtpdate}[1]%
  {\date{#1}}
\newcommand*{\vubtpmonth}[1]%
  {\renewcommand*{\vubtp@month}%
     {#1}}
\newcommand*{\vubtpyear}[1]%
  {\renewcommand*{\vubtp@year}%
     {#1}}
\newcommand*{\vubtppromotor}[1]%
  {\renewcommand*{\vubtp@promotor}%
     {#1}}
\newcommand*{\vubtpadvisor}[1]%
  {\renewcommand*{\vubtp@advisor}%
     {#1}}
\newcommand*{\vubtpfaculty}[1]%
  {\renewcommand*{\vubtp@faculty}%
     {#1}}
\newcommand*{\vubtpdepartment}[1]%
  {\renewcommand*{\vubtp@department}%
     {#1}}
```

```
\newcommand*{\vubtpreason}[1]%
  {\renewcommand*{\vubtp@reason}%
     {#1}}
\newcommand*{\vubtpresearchgroup}[1]%
  {\renewcommand*{\vubtp@researchgroup}%
     {#1}}
\newcommand*{\vubtpadvisortitle}[1]%
  {\renewcommand*{\vubtp@advisortitle}%
     {#1}}
\newcommand*{\vubtppromotortitle}[1]%
  {\renewcommand*{\vubtp@promotortitle}%
     {#1}}
\newcommand*{\vubtpacademicyear}[1]%
  {\renewcommand*{\vubtp@academicyear}%
     {#1}}
\newcommand*{\vubtpacademicyeartitle}[1]%
  {\renewcommand*{\vubtp@academicyeartitle}%
     {#1}}
\newcommand*{\vubtpsubmissiondatetitle}[1]%
  {\renewcommand*{\vubtp@submissiondatetitle}%
     {#1}}
\newcommand*{\vubtpbaseskipmultiplier}[1]%
  {\renewcommand*{\vubtp@baseskipmultiplier}%
     {#1}}
\newcommand*{\vubtptitledelimiter}[1]%
  {\renewcommand*{\vubtp@titledelimiter}%
     {#1}}
\newcommand*{\vubtpdrafttext}[1]%
  {\renewcommand*{\vubtp@drafttext}%
     {#1}}

% Internal implementation
\newlength{\vubtp@xpos}
\newlength{\vubtp@ypos}
\newlength{\vubtp@trimtop}
\newlength{\vubtp@trimedge}
\newlength{\vubtp@fontsize}
\newlength{\vubtp@baseskip}

\deflength{\vubtp@trimtop}{\z@}
\deflength{\vubtp@trimedge}{\z@}

\renewcommand{\maketitle}%
  {\begingroup

     \iftoggle{vubtp@memoir}%
       {\ifboolexpr%
          {test {\ifdimequal{\paperheight}{297mm}}
           and
           test {\ifdimequal{\paperwidth}{210mm}}}%
          {}%
          {\PackageError{vubtitlepage}%
            {Only A4 paper is supported}%
            {Try passing the option `a4paper'
             to the documentclass.}}

        \checkoddpage
        \deflength{\vubtp@trimtop}{\trimtop}
        \ifboolexpr%
          {not bool {oddpage}
           and
           bool {@twoside}}%
          {\deflength{\vubtp@trimedge}{\trimedge}}%
          {\deflength{\vubtp@trimedge}%
             {\stockwidth - \paperwidth - \trimedge}}

        \begin{titlingpage*}}%
       {\ifboolexpr%
          {test {\ifdimequal{\paperheight}{297mm}}
           and
           test {\ifdimequal{\paperwidth}{210mm}}}%
          {}%
          {\PackageError{vubtitlepage}%
            {Only A4 paper is supported}%
            {Try passing the option `a4paper'
             to the documentclass\MessageBreak%
             or use geometry package to set the
             `paperheight' to 297mm\MessageBreak%
             and the `paperwidth' to 210mm.}}
```

```
    \begin{titlepage}}

\deflength{\tabcolsep}{3\p@}% original 6pt
\deflength{\parindent}{\z@}% original 15pt
\deflength{\parskip}{\z@skip}

\fontspec{\vubtp@font}%
  [Ligatures=TeX,
   Numbers=OldStyle]

% DRAFT
\ifbool{vubtp@draft}%
  {\deflength{\vubtp@xpos}%
     {18.01160\p@ + .5\paperwidth + \vubtp@trimedge}
   \deflength{\vubtp@ypos}%
     {-13.46725\p@ + .5\paperheight + \vubtp@trimtop}
   \deflength{\vubtp@fontsize}{24\p@}
   \deflength{\vubtp@baseskip}%
     {\vubtp@baseskipmultiplier%
      \vubtp@fontsize}

   %\begin{tikzpicture}%
   %  [remember picture,
   %   overlay]
   %  \node%
   %    [xshift=1cm,
   %     yshift=1cm]
   %    at
   %    (current page.north)
   %    [text width=7cm,
   %     fill=red!20,
   %     rounded corners,
   %     above right]
   %  {
   %    This is an absolutely positioned text in the
   %    lower left corner. No shipout-hackery is used.
   %  };
   %\end{tikzpicture}

   \begin{tikzpicture}%
     [remember picture,
      overlay]
     \node%
       [rotate=45,
        scale=5,
        color=vubtp@drafttextcolor,
        %anchor=center,
        %inner sep=\z@,
        xshift=\vubtp@xpos,
        yshift=\vubtp@ypos,
        font=\fontsize%
          {\vubtp@fontsize}%
          {\vubtp@baseskip}%
          \selectfont]
       at
       (current page.north west)
       {\vubtp@drafttext};
   \end{tikzpicture}}%
  {}

% VUB LOGO
\deflength{\vubtp@xpos}{15mm + \vubtp@trimedge}
\deflength{\vubtp@ypos}{12mm + \vubtp@trimtop}
\begin{textblock*}%
  {75.5mm}%
  (\vubtp@xpos,
   \vubtp@ypos)
  \includegraphics%
    [width=75.5mm,
     height=15.25mm]%
    {VUB_logo.pdf}
\end{textblock*}

% VERTICAL LINE
\deflength{\vubtp@xpos}%
  {38.5mm + \vubtp@trimedge}
\deflength{\vubtp@ypos}{25mm + \vubtp@trimtop}
\begin{textblock*}%
```

```
    {.25\p@}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \rule%
      {.25\p@}%
      {247mm}
  \end{textblock*}

  % FACULTY, DEPARTMENT & RESEARCHGROUP
  \deflength{\vubtp@xpos}{41mm + \vubtp@trimedge}
  \deflength{\vubtp@ypos}{25mm + \vubtp@trimtop}
  \deflength{\vubtp@fontsize}{9\p@}
  \deflength{\vubtp@baseskip}%
    {\vubtp@baseskipmultiplier%
     \vubtp@fontsize}
  \begin{textblock*}%
    {159mm}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \begin{minipage}%
      [t]%
      {159mm}
      \fontsize%
        {\vubtp@fontsize}%
        {\vubtp@baseskip}%
      \selectfont%
      \MakeTextUppercase{\vubtp@faculty}%
      \ifdefempty{\vubtp@faculty}%
        {}%
        {\\}%
      \vubtp@department%
      \ifbool{vubtp@research}%
        {\ifdefempty{\vubtp@department}%
           {}%
           {\\}%
         \vubtp@researchgroup}%
        {}
    \end{minipage}
  \end{textblock*}

  % FIRST SECTION
  \deflength{\vubtp@xpos}{48mm + \vubtp@trimedge}
  \deflength{\vubtp@ypos}{100mm + \vubtp@trimtop}
  \deflength{\vubtp@fontsize}{22\p@}
  \deflength{\vubtp@baseskip}%
    {\vubtp@baseskipmultiplier%
     \vubtp@fontsize}
  \begin{textblock*}%
    {152mm}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \ifbool{vubtp@longtitle}%
      {\begin{minipage}%
         [c]%
         [27mm]%
         [b]%
         {152mm}}%
      {\begin{minipage}%
         [c]%
         {152mm}}
    \fontsize%
      {\vubtp@fontsize}%
      {\vubtp@baseskip}%
    \selectfont%
    \@title
    \end{minipage}
  \end{textblock*}

  \deflength{\vubtp@xpos}%
    {38.5mm + \vubtp@trimedge}
  \deflength{\vubtp@ypos}{140mm + \vubtp@trimtop}
  \begin{textblock*}%
    {161.5mm}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \rule%
      {161.5mm}%
      {.25\p@}
  \end{textblock*}
```

```
470
    % SECOND SECTION
    \deflength{\vubtp@xpos}{48mm + \vubtp@trimedge}
    \deflength{\vubtp@ypos}%
      {142.25mm + \vubtp@trimtop}% originally 144mm
475 \deflength{\vubtp@fontsize}{9\p@}
    \deflength{\vubtp@baseskip}%
      {\vubtp@baseskipmultiplier%
       \vubtp@fontsize}
    \begin{textblock*}%
480   {152mm}%
      (\vubtp@xpos,
       \vubtp@ypos)
      \begin{minipage}%
        [t]%
485     {152mm}
        \fontsize%
          {\vubtp@fontsize}%
          {\vubtp@baseskip}%
        \selectfont%
490     \vubtp@reason
      \end{minipage}
    \end{textblock*}

    \deflength{\vubtp@xpos}{48mm + \vubtp@trimedge}
495 \deflength{\vubtp@ypos}%
      {151.5mm + \vubtp@trimtop}% originally 149mm
    \deflength{\vubtp@fontsize}{24\p@}
    \deflength{\vubtp@baseskip}%
      {\vubtp@baseskipmultiplier%
500    \vubtp@fontsize}
    \begin{textblock*}%
      {152.25mm}%
      (\vubtp@xpos,
       \vubtp@ypos)
505   \fontsize%
        {\vubtp@fontsize}%
        {\vubtp@baseskip}%
      \selectfont%
      \@author
510 \end{textblock*}

    \deflength{\vubtp@xpos}%
      {38.5mm + \vubtp@trimedge}
    \deflength{\vubtp@ypos}{160mm + \vubtp@trimtop}
515 \begin{textblock*}%
      {161.5mm}%
      (\vubtp@xpos,
       \vubtp@ypos)
      \rule%
520     {161.5mm}%
        {.25\p@}
    \end{textblock*}

    % THIRD SECTION
525 % ACADEMIC YEAR
    \deflength{\vubtp@xpos}{48mm + \vubtp@trimedge}
    \deflength{\vubtp@ypos}{170mm + \vubtp@trimtop}
    \deflength{\vubtp@fontsize}{12\p@}
    \deflength{\vubtp@baseskip}%
530   {\vubtp@baseskipmultiplier%
       \vubtp@fontsize}
    \begin{textblock*}%
      {152mm}%
      (\vubtp@xpos,
535    \vubtp@ypos)
      \begin{minipage}%
        [t]%
        {152mm}
        \fontsize%
540       {\vubtp@fontsize}%
          {\vubtp@baseskip}%
        \selectfont%
        \vubtp@academicyeartitle%
        \ifdefempty{\vubtp@academicyeartitle}%
545       {}%
          {\space\space}%
        \vubtp@academicyear%
        \ifboolexpr%
```

```
          {not ( test {\ifdefempty{\vubtp@academicyeartitle}}
           and
           test {\ifdefempty{\vubtp@academicyear}} )}%
          {\par
           \vspace{\baselineskip}}%
          {}%
        \begin{tabular}%
          {@{\hspace{-\arrayrulewidth}}ll}
          \vubtp@promotortitle%
          \vubtp@titledelimiter &
          \begin{minipage}%
            [t]%
            {100mm}
            \vubtp@promotor%
            \strut% or \smallskip
          \end{minipage}
          \\% or \tabularnewline
          \vubtp@advisortitle%
          \vubtp@titledelimiter &
          \begin{minipage}%
            [t]%
            {100mm}
            \vubtp@advisor%
            \strut% or \smallskip
          \end{minipage}
        \end{tabular}
    \end{minipage}
  \end{textblock*}

  % DATE
  \deflength{\vubtp@xpos}{48mm + \vubtp@trimedge}
  \deflength{\vubtp@ypos}%
    {269.5mm + \vubtp@trimtop}% originally 270mm
  \deflength{\vubtp@fontsize}{10\p@}
  \deflength{\vubtp@baseskip}%
    {\vubtp@baseskipmultiplier%
     \vubtp@fontsize}
  \begin{textblock*}%
    {152mm}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \begin{minipage}%
      [t]%
      {152mm}
      \fontsize%
        {\vubtp@fontsize}%
        {\vubtp@baseskip}%
      \selectfont%
      \ifbool{vubtp@officialsubformat}%
        {\MakeTextUppercase{\vubtp@month}%
          \ifdefempty{\vubtp@month}%
            {}%
            {\space\space}%
          {\fontspec{\vubtp@font}%
           \vubtp@year}}%
        {\vubtp@submissiondatetitle%
         \vubtp@titledelimiter%
         \ifboolexpr%
           {not ( test {\ifdefempty{\vubtp@submissiondatetitle}}
            and
            test {\ifdefempty{\vubtp@titledelimiter}} )}%
           {\space}%
           {}%
         \@date}
    \end{minipage}
  \end{textblock*}

  % VUB CREST
  \deflength{\vubtp@xpos}{157mm + \vubtp@trimedge}
  \deflength{\vubtp@ypos}{229mm + \vubtp@trimtop}
  \begin{textblock*}%
    {43mm}%
    (\vubtp@xpos,
     \vubtp@ypos)
    \ifbool{vubtp@altshield}%
      {\includegraphics%
         [width=43mm,
          height=43mm]%
         {VUB_schild_alt.pdf}}%
```

```
        {\includegraphics%
           [width=43mm,
            height=43mm]%
           {VUB_schild.pdf}}
    \end{textblock*}

    \null

    \iftoggle{vubtp@memoir}%
      {\end{titlingpage*}}%
      {\end{titlepage}}

  \endgroup}

\endinput
%%
%% End of file `vubtitlepage.sty'.
```

C.2 VUB Thesis Class

Listing C.2: vubthesis.cls.

vubthesis.cls

```
% Author: Pieter Stroobants
% Update 26 May 2015

% Note: if macros or environments add
% unwanted space around themselves,
% add \@bsphack ... \@esphack as the
% first and as the last instruction
% of the definition respectively

\NeedsTeXFormat{LaTeX2e}%
  [2015/01/01]
\ProvidesClass{vubthesis}%
  [2015/05/26
   v1.0
   Thesis class for the `Vrije Universiteit Brussel' (VUB)]

% `\IncludeInRelease' is now present in LaTeX format file.
%%\RequirePackage{latexrelease}
\RequirePackage{etex}% loaded by memoir
\RequirePackage{letltxmacro}
\RequirePackage{kvoptions}
\RequirePackage{etoolbox}

\SetupKeyvalOptions%
  {family=vubth,
   prefix=vubth@}

% Global Document Options
\DeclareStringOption%
  [ieee-alphabetic]%
  {bibstyle}%
  [ieee-alphabetic]
\DeclareStringOption%
  [mt]%
  {thesistype}%
  [mt]
\DeclareBoolOption%
  [true]%
  {englishlang}
% Mark foreign phrases in their original language
% Warning: this feature causes spurious spaces
\DeclareBoolOption%
  [false]%
  {markforeignphrases}
\DeclareBoolOption%
  [true]%
  {standardfonts}
\DeclareBoolOption%
  [true]%
  {headersecatedge}
\DeclareBoolOption%
  [true]%
```

```
    {isolayout}
\DeclareBoolOption%
  [false]%
  {zeroparindent}
\DeclareBoolOption%
  [true]%
  {zeroparskip}
\DeclareBoolOption%
  [true]%
  {forcea4stock}
\DeclareBoolOption%
  [true]%
  {forcea4page}
\DeclareBoolOption%
  [false]%
  {pagenotes}
\DeclareBoolOption%
  [false]%
  {isochangemarks}
\DeclareBoolOption%
  [false]%
  {bibdictmarks}
\DeclareBoolOption%
  [false]%
  {acrodictmarks}
\DeclareBoolOption%
  [true]%
  {idxdictmarks}
% pagenote dictionary marks
\DeclareBoolOption%
  [false]%
  {pgndictmarks}
\DeclareBoolOption%
  [false]%
  {chaptertoc}
\DeclareBoolOption%
  [false]%
  {appendixtoc}
\DeclareBoolOption%
  [false]%
  {graphicspath}
% force final graphics in draft mode
\DeclareBoolOption%
  [false]%
  {finalgraphics}
% force final attachments in draft mode
\DeclareBoolOption%
  [true]%
  {finalattachments}
% show cite keys in draft mode
\DeclareBoolOption%
  [false]%
  {showkeys}
% nocite all bibliography items in draft mode
\DeclareBoolOption%
  [false]%
  {nociteall}
% overwrite the url access date with today
\DeclareBoolOption%
  [false]%
  {urldatetoday}
% use all acronyms in draft mode
\DeclareBoolOption%
  [false]%
  {acronymall}
% show indexmarks in draft mode
\DeclareBoolOption%
  [true]%
  {indexmarks}
% set `errorcontextlines' in draft mode
\DeclareBoolOption%
  [true]%
  {errorcontextall}
\DeclareBoolOption%
  [true]%
  {minted}
% Do not capitalize common articles and conjunctions.
\DeclareBoolOption%
  [true]%
```

```
  {nocapartconj}
% Support the `xymtexpdf' package.
% Disabled by default because this package requires
% the old font commands to be enabled.
\DeclareBoolOption%
  [false]%
  {xymtex}
% Generate a digital version with i.a. attachments shown.
\DeclareBoolOption%
  [true]%
  {digital}
% Capitalize `cref' references.
\DeclareBoolOption%
  [true]%
  {capitalizecref}
\DeclareComplementaryOption%
  {dutchlang}%
  {englishlang}
\DeclareComplementaryOption%
  {optimizedfonts}%
  {standardfonts}
\DeclareComplementaryOption%
  {headerchapatedge}%
  {headersecatedge}
\DeclareComplementaryOption%
  {maxpagelayout}%
  {isolayout}
\DeclareComplementaryOption%
  {nonzeroparindent}%
  {zeroparindent}
\DeclareComplementaryOption%
  {nonzeroparskip}%
  {zeroparskip}
\DeclareComplementaryOption%
  {listings}%
  {minted}
\DeclareComplementaryOption%
  {print}%
  {digital}
\DeclareComplementaryOption%
  {nocapitalizecref}%
  {capitalizecref}

% Unrecognized Options
\DeclareDefaultOption%
  {\PassOptionsToClass%
     {\CurrentOption}%
     {memoir}}

\ProcessKeyvalOptions*

% Support for the `xymtexpdf' package requires
% the option `oldfontcommands' to be passed
% to the `memoir' class. This should be fixed
% by the package, i.e. they should use \texttt
% instead of \tt.
% This test should come before \LoadClass,
% therefore it is here.
\ifbool{vubth@xymtex}%
  {\PassOptionsToClass%
     {oldfontcommands}%
     {memoir}}%
  {}

\LoadClass{memoir}

% Interesting Memoir "side" features:
% 1. \marginpar is the normal floating margin paragraph. Thus
%    multiple marginpars are typeset after each other.
% 2. \sidepar is a non floating paragraph that starts its first
%    line at the location of where it is defined. If multiple
%    sidepars exits they may overlap.
% 3. \sidebar is bar that starts on top of the page and
%    continues to the next page if required. If several sidebars
%    exist they are typeset one after the other.

%-----------------------------------------------------------------------
% LOCAL (SECTION DEPENDENT) OPTIONS

```

```
% Allow english abbreviations when possible
\newtoggle{abbrevenglish}
\toggletrue{abbrevenglish}
% Allow dutch abbreviations when possible
\newtoggle{abbrevdutch}
\toggletrue{abbrevdutch}
% Allow latin abbreviations when possible
\newtoggle{abbrevlatin}
\toggletrue{abbrevlatin}
% Convenience toggle to detect a research training document
\newtoggle{researchtraining}
% Convenience toggle to detect a digital version
% of the document versus a print version
\newtoggle{digitalversion}

%-------------------------------------------------------------------------
% ERRORCONTEXTLINES

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@errorcontextall}}%
  {\defcounter{errorcontextlines}{999}}%
  {}

%-------------------------------------------------------------------------
% GOBBLERS

\newcommand{\vubth@gobbleopt}%
  {\@ifnextchar[%
     {\vubth@gobbleopt@}%
     {}}

% added \long to \vubth@gobbleopt@ in order to comply
% to all other definitions, i.e. they also allow
% \par tokens in the optional argument
\newcommand{\vubth@gobbleopt@}[1][]%
  {}

\newcommand{\vubth@gobbleoneoptandone}%
  {\@ifnextchar[%
     {\vubth@gobbleoneoptandone@}%
     {\@gobble}}

\newcommand{\vubth@gobbleoneoptandone@}[1][]%
  {\@gobble}

\newcommand{\vubth@gobbleallopt}%
  {\@ifnextchar[%
     {\vubth@gobbleallopt@}%
     {}}

\newcommand{\vubth@gobbleallopt@}[1][]%
  {\@ifnextchar[%
     {\vubth@gobbleallopt@}%
     {}}

% These macros can not be replaced in terms of LaTeX
% newcommands because they use TeX `delimited' args
\long\def\@gobbletofi#1#2\fi{\fi#1}
\long\def\@gobbletoelse#1#2\else{\else#1}
\long\def\@gobbletoor#1#2\or{\or#1}

%-------------------------------------------------------------------------
% GLOBAL (RE)NEWCOMMAND

% http://tex.stackexchange.com/questions/51733/
% global-renewcommand-equivalent-of-global-def
% This feature is currently unused.
%\def\gnewcommand{\g@star@or@long\gnew@command}
%\def\grenewcommand{\g@star@or@long\grenew@command}
%\def\g@star@or@long#1{%
%  \@ifstar{\let\l@ngrel@x\global#1}{\def\l@ngrel@x{\long\global#1}}
%\def\gnew@command#1{\@testopt{\@gnewcommand#1}0}
%\def\@gnewcommand#1[#2]{%
%  \kernel@ifnextchar [{\@gxargdef#1[#2]}%
%                {\@argdef#1[#2]}}
%\let\@gxargdef\@xargdef
%\patchcmd{\@gxargdef}{\def}{\gdef}{}{}
```

```
%\let\grenew@command\renew@command
%\patchcmd{\grenew@command}{\new@command}{\gnew@command}{}{}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% IFFILEEXISTS EXTENSIONS

\newcommand{\IfPackageExists}[3]%
  {\IfFileExists{#1.\@pkgextension}%
     {#2}%
     {#3}}
\newcommand{\IfClassExists}[3]%
  {\IfFileExists{#1.\@clsextension}%
     {#2}%
     {#3}}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% BASIC TESTS

% disabling memoir stock selection class options
% i.e. we force an a4 stock (physical paper)
\ifbool{vubth@forcea4stock}%
  {\stockaiv
   % \settrimmedsize can be changed into \pageaiv
   % but we use \settrimmedsize so that when we change
   % the previous line, the next line is automatically
   % adapted. I.e. the page size will always be equal
   % to the stock size.
   \settrimmedsize%
     {\stockheight}%
     {\stockwidth}%
     {*}}%
  {}

\RequireXeTeX

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% MEMOIR HACKS

% THMBOX
\let\memoirleftbar\leftbar% ok, no optional argument
\let\endmemoirleftbar\endleftbar% ok, no optional argument
\undef{\leftbar}% or \@undefined , \relax (comment applies to all \undef)
\undef{\endleftbar}

% FMTCOUNT
%\let\memoirordinal\ordinal% ok, no optional argument
%\undef{\ordinal}% ok fmtcount uses etoolbox

% MINTED
%\LetLtxMacro{\memoirnewfloat}{\newfloat}% ok

% GLOSSARIES
\LetLtxMacro{\memoirprintglossary}{\printglossary}% ok
\let\memoirtheglossary\theglossary% ok, no optional argument
\let\endmemoirtheglossary\endtheglossary% ok, no optional argument
\undef{\printglossary}% ok glossaries uses etoolbox
\undef{\theglossary}% ok glossaries uses etoolbox
\undef{\endtheglossary}% ok glossaries uses etoolbox

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% DEFAULT FONT SETUP

\ifbool{vubth@standardfonts}%
  {\newcommand*{\vubth@titlepagefont}%
     {Latin Modern Sans}
   \newcommand*{\vubth@mainfont}%
     {Latin Modern Roman}
   \newcommand*{\vubth@sansfont}%
     {Latin Modern Sans}
   \newcommand*{\vubth@monofont}%
     {Computer Modern Typewriter}
   \newcommand*{\vubth@mathfont}%
     {Latin Modern Roman}}%
  {\newcommand*{\vubth@titlepagefont}%
     {Myriad Pro}
   \newcommand*{\vubth@mainfont}%
     {Minion Pro}% Adobe Caslon Pro
   \newcommand*{\vubth@sansfont}%
     {Myriad Pro}
```

```
    \newcommand*{\vubth@monofont}%
      {DejaVu Sans Mono}
    \newcommand*{\vubth@mathfont}%
      {XITS Math}}% or Asana Math

%-------------------------------------------------------------------------
% LOADING PACKAGES

% Automatically load the `nag' package
% when in draft mode.
\ifbool{draftdoc}%
  {\RequirePackage%
     [l2tabu,
      orthodox]%
     {nag}}%
  {}

\RequirePackage{amsmath}
\RequirePackage{amsthm}

% AMSTHM
% Automatically done by thmtools
%\LetLtxMacro{\amsproof}{\proof}
% Not necessary since `end' macros
% do not have optional arguments.
% But we opted to use \LetLtxMacro for symmetry.
%\LetLtxMacro{\endamsproof}{\endproof}

\RequirePackage{morewrites}
\RequirePackage{flafter}
\RequirePackage{mathtools}
\RequirePackage{empheq}
\RequirePackage%
  [samesize]%
  {cancel}

% After loading of the package, the comma will be typeset
% as a punctuation character, if the next input character
% is a space; otherwise the comma is treated as a decimal separator.
% Thus, a decimal number is to be entered as, for instance, 1,234
% whereas the mathematical expression (x, y) is to be written with
% a space after the comma: (x, y)
% In case the 'intelligent comma' is used together with the
% dcolumn package (emulated by memoir), a comma to be printed as
% the decimal separator in a column of type D is to be specified as
% {\mathord\mathcomma}, rather than {,}, since the latter leads to
% an error. For instance:
% \begin{tabular}{... D{,}{\mathord\mathcomma}{2} ...}
% Note that specifying the comma as the related input character
% works as usual. Generally, since the icomma package makes
% the comma 'active', further problems are not unlikely.
\notbool{vubth@englishlang}%
  {\RequirePackage{icomma}}%
  {}

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@finalgraphics}}%
  {\PassOptionsToPackage%
     {final}%
     {graphicx}}%
  {}
\RequirePackage%
  [hiresbb]% boolean in graphicx, but no key/val in `graphics'.
  {graphicx}

\RequirePackage%
  [table,
   hyperref,
   dvipsnames]%
  {xcolor}

% Load either `thmbox' or `shadethm' package
% to be supported by `thmtools'.
% `shadethm' requires the `color' package.
% This is why we load `thmtools' later than
% the other math packages.
\RequirePackage%
```

```
  [unq]%
  {unique}
\RequirePackage{thmtools}
\RequirePackage{qrcode}
\RequirePackage{rotating}
%\RequirePackage{epstopdf}% apparently not supported by XeLaTeX
\RequirePackage{pdfpages}
\RequirePackage{afterpage}

% Symbols
\RequirePackage{hologo}
\RequirePackage{textcomp}
\RequirePackage{wasysym}
\RequirePackage{simpsons}
\RequirePackage{eurosym}

% Font
\RequirePackage{soul}
\RequirePackage%
  [ifinal]%
  {modroman}
\RequirePackage{fontspec}
\RequirePackage{xltxtra}
\RequirePackage{unicode-math}

% Language
\RequirePackage%
  [babelshorthands]%
  {polyglossia}
% Loaded after `polyglossia', but before
% setting the language because otherwise
% it generates an error if a language other
% than English is selected. Loaded after
% `polyglossia' because than it can detect
% `babel' style language selection.
\RequirePackage{iflang}

%-----------------------------------------------------------------------
% LANGUAGE

% Polyglossia
% Variants: american, british, australian,
% newzealand are supported by both babel
% (is used by package datetime) and polyglossia.
% Additionally polyglossia supports: usmax
% Additionally babel supports: USenglish, UKenglish, canadian
%
% Datetime2
% Load the language modules in datetime2
% as polyglossia language variants are not
% auto detected by `tracklang'.
% Also: Only default language is detected.
\ifbool{vubth@englishlang}%
  % english variant=usmax for more hyphenation patterns
  {\setdefaultlanguage%
     [variant=american]%
     {english}
    \setotherlanguages{dutch,latin}
    \PassOptionsToPackage%
      {latin,dutch,en-US}%
      {datetime2}}%
  {\setdefaultlanguage{dutch}
   \setotherlanguage%
     [variant=american]%
     {english}
   \setotherlanguage{latin}
   \PassOptionsToPackage%
     {latin,en-US,dutch}%
     {datetime2}}

\ifbool{vubth@englishlang}%
  {\PassOptionsToPackage%
     {dutch,american}%
     {varioref}
   \PassOptionsToPackage%
     {american}%
     {fnumprint}}%
  {\PassOptionsToPackage%
     {american,dutch}%
```

```
    {varioref}}

% CHEMMACROS
% Package chemmacros defines a latin command,
% so we need to rename the polyglossia version.
\LetLtxMacro{\polylatin}{\latin}% ok
% Not necessary since `end' macros
% do not have optional arguments.
% But we opted to use \LetLtxMacro for symmetry.
\LetLtxMacro{\endpolylatin}{\endlatin}% ok
% For symmetry with the above environment.
% Currently not used in the actual text,
% since this command is not redefined.
\LetLtxMacro{\textpolylatin}{\textlatin}% ok
\undef{\latin}% ok
\undef{\endlatin}% ok

%-------------------------------------------------------------------------
% CONTINUE LOADING PACKAGES

\ifbool{vubth@englishlang}%
  {\ifbool{vubth@nocapartconj}%
     {\RequirePackage{mfirstuc-english}}%
     {\RequirePackage{mfirstuc}}}%
  {\ifbool{vubth@nocapartconj}%
     {\IfPackageExists{mfirstuc-dutch}%
        {\RequirePackage{mfirstuc-dutch}}%
        {\RequirePackage{mfirstuc}}}%
     {\RequirePackage{mfirstuc}}}

%%\RequirePackage{extramarks}
\RequirePackage%
  [noxspace]%
  {he-she}
\RequirePackage%
  [colaction]%
  {multicol}

% Load `fancybox' before `fancyvrb' in order to resolve
% a package conflict between both. This conflict became
% clear after using the `minted' package which needs
% `fancyvrb' for typesetting listings.
\RequirePackage{fancybox}
\RequirePackage{fancyvrb}

\RequirePackage{siunitx}
\RequirePackage%
  [autostyle=true]%
  {csquotes}
\RequirePackage{lettrine}
\RequirePackage{calcage}
\RequirePackage{randtext}
\RequirePackage{xstring}

\ifbool{vubth@minted}%
  {\RequirePackage%
     [nofloat]%
     {minted}}%
  {\RequirePackage{listings}
   \RequirePackage{lstautogobble}}

\RequirePackage{tikz}
\RequirePackage{media9}

% after media9 because of `\c_backslash_str' definition
% in `l3regex.sty' loaded by media9.
\RequirePackage{xpatch}
\RequirePackage{tcolorbox}
\RequirePackage%
  [ghsystem]%
  {chemmacros}

\ifbool{vubth@xymtex}%
  {\RequirePackage{xymtexpdf}}%
  {}

% Vub title page
\ifbool{draftdoc}%
  {\PassOptionsToPackage%
```

```
    {customsubformat}%
    {vubtitlepage}}%
  {}
% \vubth@titlepagefont is wrapped in a group so that
% we can pass a font name containing spaces.
\RequirePackage%
  [font={\vubth@titlepagefont},
   research]%
  {vubtitlepage}

% Load some draft only packages
\ifbool{draftdoc}%
  {\RequirePackage{blindtext}

   % Todonotes Option:
   % obeyDraft is used by default
   % (by this class in the way the code is written)
   \RequirePackage%
     [colorinlistoftodos,
      prependcaption]%
     {todonotes}}%
  {}

\RequirePackage%
  [babel=true]%
  {microtype}
\RequirePackage{multirow}

\ifbool{vubth@englishlang}%
  {\PassOptionsToPackage%
     {point}%
     {rccol}}%
  {}
\RequirePackage{rccol}

\RequirePackage%
  [fixFPpow]%
  {tabularcalc}
\RequirePackage{calctab}
\RequirePackage{longtable}
%\RequirePackage{arydshln}
\RequirePackage%
  %[linegoal]%
  {tabu}
\RequirePackage%
  [inline,
   shortlabels]%
  {enumitem}
\RequirePackage{censor}

% Use the macros from biblatex instead
%%\RequirePackage%
%%  [htt]%
%%  {hyphenat}
\RequirePackage%
  [useregional=text,
   showdow=true]%
  {datetime2}

% Needs to be saved because `polyglossia' redefines
% \today each time a different language is selected.
% Also package `pdfcomment' loads the old `datetime'
% package which also overrides the definition of \today.
\let\DTMtoday\today
% For synchronicity with \DTMtoday, we define \DTMToday
% This is not really necessary since \Today is not
% redefined by any package at the moment,
% except when you decide to load the Spanish language.
\let\DTMToday\Today

\RequirePackage{idxcmds}
\RequirePackage{varindex}
\RequirePackage{xesearch}
\RequirePackage{xeindex}
\RequirePackage{url}

% Some people have commented that the printing of the \ref and \cite
% keys is less useful than the printing of the \label keys
% and so showkeys now supports two options that can be given
```

```
% in the \usepackage command:
% `notref' to stop the redefinition of \ref and \pageref,
% and related commands from the varioref package.
% `notcite' to stop the redefinition of \cite
% and related commands from the harvard and natbib packages.
% So if the package is loaded with \usepackage[notref]{showkeys}
% then \ref will have its standard definition,
% but \label will print its key argument (usually in the margin).
\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@showkeys}}%
  {\RequirePackage%
     [notref,
      notcite]%
     {showkeys}}%
  {}

% Biblatex options:
% maxnames=5,minnames=3,defernumbers=true,indexing=true
\RequirePackage%
  [style=\vubth@bibstyle,
   backend=biber,
   alldates=comp,
   sortcites=true,
   defernumbers=true,
   autolang=langname]%
  {biblatex}
%\RequirePackage{nameref}
\RequirePackage{varioref}
\RequirePackage%
  [pdfversion=1.7]%
  {hyperref}
\RequirePackage{hypcap}

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@finalattachments}}%
  {\PassOptionsToPackage%
     {final}%
     {attachfile2}}%
  {}
\RequirePackage{attachfile2}

\RequirePackage{pdfcomment}

% Glossaries style=listdotted,listgroup,indexgroup
% entrycounter can be useful to number the glosses.
\RequirePackage%
  [nomain,
   toc,
   acronym,
   style=indexgroup]%
  {glossaries}

% Cleveref defines: cref,Cref,crefrange,Crefrange commands.
% Ps. Default package option name is `capitalise', in UK English.
% The American variant `capitalize' also works, but we prefer
% to pass the option name as it is implemented, not the alias.
\ifbool{vubth@capitalizecref}%
  {\PassOptionsToPackage%
     {capitalise}%
     {cleveref}}%
  {}
\RequirePackage%
  [noabbrev,
   nameinlink]%
  {cleveref}
%\RequirePackage{bidi}

%-------------------------------------------------------------------------
% COLOR

\definecolor{tablegray}%
  {cmyk/gray}%
  {0,0,0,.1/.9}% my table color
\definecolor{nicered}%
  {cmyk/RGB}%
```

```
    {0,1,1,.6/102,0,0}% chapter style color
765
\definecolor{javared}%
  {cmyk/RGB}%
  {0,1,1,.4/153,0,0}% for strings
\definecolor{javagreen}%
770   {cmyk/RGB}%
  {1,0,1,.4/0,153,0}% comments
\definecolor{javapurple}%
  {cmyk/RGB}%
  {0,1,0,.4/153,0,153}% keywords
775 \definecolor{javablue}%
  {cmyk/RGB}%
  {1,1,0,.4/0,0,153}% javadoc

% VUB Logo Colors
780 \definecolor{vubgreen}%
  {cmyk/RGB}%
  {.07,0,1,.28/171,178,2}% Pantone398
\definecolor{vubdarkgray}%
  {cmyk/RGB}%
785   {.03,0,.31,.75/95,96,74}% Pantone418

% VUB Logo LightGray: Original RGB 127,115,88
\definecolor{vublightgray}%
  {cmyk/RGB}%
790   {0,.1,.27,.5/140,130,110}% Pantone7531

% VUB Faculties Colors
\definecolor{vubwe}%
  {cmyk/RGB}%
795   {.49,0,1,.39/80,120,17}% Pantone576
\definecolor{vublk}%
  {cmyk/RGB}%
  {1,.45,0,.37/6,56,104}% Pantone2955
\definecolor{vubes}%
800   {cmyk/RGB}%
  {0,.53,1,0/255,120,0}% Pantone021
\definecolor{vubrg}%
  {cmyk/RGB}%
  {0,1,.65,.28/180,0,32}% Pantone7427
805 \definecolor{vubpe}%
  {cmyk/RGB}%
  {1,0,.16,.09/1,142,159}% Pantone3135
\definecolor{vubtw}%
  {cmyk/RGB}%
810   {0,0,0,.44/143,143,143}% Pantone423
\definecolor{vubgf}%
  {cmyk/RGB}%
  {0,.97,1,0/255,13,0}% Pantone485
\definecolor{vublw}%
815   {cmyk/RGB}%
  {0,.18,1,.15/217,178,0}% Pantone117

%-----------------------------------------------------------------------
% FONT
820
% Commands to save font name for use in text
\newcommand*{\titlepagefontname}%
  {\vubth@titlepagefont}
\newcommand*{\mainfontname}%
825   {\vubth@mainfont}
\newcommand*{\sansfontname}%
  {\vubth@sansfont}
\newcommand*{\monofontname}%
  {\vubth@monofont}
830 \newcommand*{\mathfontname}%
  {\vubth@mathfont}

% Fontspec setup
\newfontfeature{Microtype}%
835   {protrusion=default;
   expansion=default}
% ps: Microtype only works with the standard fonts
% \defaultfontfeatures{Ligatures=TeX}
% Enabled by default (main & sans) in recent versions of fontspec
840 \setmainfont{\vubth@mainfont}%
  [Microtype,
   Numbers=OldStyle]
```

```
% Cabin is a good sans serif alternative
\setsansfont{\vubth@sansfont}%
  [Microtype,
   Numbers=OldStyle]
\setmonofont{\vubth@monofont}%
  [Microtype,
   Scale=MatchLowercase]
% use \fontspec{} for fonts that are used only a couple of times

% Mathspec (not used any more)
%\setmathsfont%
%  (Digits,
%   Latin,
%   Greek)%
%  [Numbers=%
%     {Lining,
%      Proportional}]%
%  {\vubth@mathfont}

% Unicode Math Font
% General Font Setup needed for `XITS Math' as well
% because otherwise the font would only be selected
% for `\mathcal', etc. leaving all other math font
% commands undefined like \oplus and \alpha.
\setmathfont{\vubth@mathfont}
% Overwrite the `\mathcal' font for `XITS Math'.
\ifdefstring{\vubth@mathfont}{XITS Math}%
  {\setmathfont%
     [range=%
        {\mathcal,
         \mathbfcal},% Only for XITS Math
      StylisticSet=1]%
     {\vubth@mathfont}}%
  {}

% VERBATIM FONT
\setverbatimfont%
  {\normalfont
   \ttfamily
   \footnotesize}

% DEFAULT FONTS
% Latin Modern Roman
\newcommand*{\lmr}%
  {\fontfamily{lmr}
   \selectfont}
% Latin Modern Sans
\newcommand*{\lmss}%
  {\fontfamily{lmss}
   \selectfont}
% Latin Modern Mono
\newcommand*{\lmtt}%
  {\fontfamily{lmtt}
   \selectfont}

% LOCAL FONT SETTINGS
%\renewcommand*{\rmdefault}%
%  {lmr}
%\renewcommand*{\sfdefault}%
%  {lmss}
%\renewcommand*{\ttdefault}%
%  {lmtt}
%\normalfont

%-------------------------------------------------------------------------
% UNICODE MATH & SIUNITX

% Unicode Math
\unimathsetup%
  {math-style=french}

% Siunitx
\sisetup%
  {detect-all}

%-------------------------------------------------------------------------
% DRM

\ifnumless{\@memptsize}{8}%
```

```
  {\newcommand*{\vubth@defaultdrmfontsize}%
     {7}}
  {\ifnumless{\@memptsize}{9}%
     {\newcommand*{\vubth@defaultdrmfontsize}%
        {8}}%
     {\ifnumless{\@memptsize}{10}%
        {\newcommand*{\vubth@defaultdrmfontsize}%
           {9}}%
        {\ifnumless{\@memptsize}{11}%
           {\newcommand*{\vubth@defaultdrmfontsize}%
              {10}}%
           {\ifnumless{\@memptsize}{12}%
              {\newcommand*{\vubth@defaultdrmfontsize}%
                 {11}}%
              {\ifnumless{\@memptsize}{14}%
                 {\newcommand*{\vubth@defaultdrmfontsize}%
                    {12}}%
                 {\ifnumless{\@memptsize}{17}%
                    {\newcommand*{\vubth@defaultdrmfontsize}%
                       {14}}%
                    {\ifnumless{\@memptsize}{24}%
                       {\newcommand*{\vubth@defaultdrmfontsize}%
                          {17}}%
                       {\newcommand*{\vubth@defaultdrmfontsize}%
                          {24}}}}}}}}}

\newfontface{\vubth@drmsymfont}%
  {drmsym\vubth@defaultdrmfontsize}%
  [Extension=.otf,
   SizeFeatures=%
     {{Size={-7},
       Font=drmsym7},
      {Size={8},
       Font=drmsym8},
      {Size={9},
       Font=drmsym9},
      {Size={10-12},
       Font=drmsym10},
      {Size={12-14},
       Font=drmsym12},
      {Size={14-17},
       Font=drmsym14},
      {Size={17-24},
       Font=drmsym17},
      {Size={24-},
       Font=drmsym24}}]

% \normalfont resets shape & weight parameters,
% just to be on the safe side.
\DeclareTextFontCommand{\vubth@drmsym}%
  {\normalfont\vubth@drmsymfont}

\newrobustcmd*{\romone}%
  {\vubth@drmsym{\symbol{'100}}}
\newrobustcmd*{\romfive}%
  {\vubth@drmsym{\symbol{'101}}}
\newrobustcmd*{\romten}%
  {\vubth@drmsym{\symbol{'102}}}
\newrobustcmd*{\romfifty}%
  {\vubth@drmsym{\symbol{'103}}}
\newrobustcmd*{\romhundred}%
  {\vubth@drmsym{\symbol{'104}}}
\newrobustcmd*{\romfivehundred}%
  {\vubth@drmsym{\symbol{'105}}}
\newrobustcmd*{\romthousand}%
  {\vubth@drmsym{\symbol{'106}}}

\renewrobustcmd*{\textasterism}%
  {\vubth@drmsym{\symbol{'302}}}

\newrobustcmd*{\textradiation}%
  {\vubth@drmsym{\symbol{'161}}}
\newrobustcmd*{\textradiationnocircle}%
  {\vubth@drmsym{\symbol{'160}}}
\newrobustcmd*{\textbiohazard}%
  {\vubth@drmsym{\symbol{'163}}}
\newrobustcmd*{\textbiohazardnocircle}%
  {\vubth@drmsym{\symbol{'162}}}
\newrobustcmd*{\texthighvoltage}%
```

```
    {\vubth@drmsym{\symbol{'166}}}
  \newrobustcmd*{\texthighvoltagenotriangle}%
    {\vubth@drmsym{\symbol{'165}}}
  \newrobustcmd*{\textgeneralwarning}%
    {\vubth@drmsym{\symbol{'164}}}

  \newrobustcmd*{\textrightupfleuron}%
    {\vubth@drmsym{\symbol{'016}}}
  \newrobustcmd*{\textrightdownfleuron}%
    {\vubth@drmsym{\symbol{'017}}}
  \newrobustcmd*{\textleftupfleuron}%
    {\vubth@drmsym{\symbol{'020}}}
  \newrobustcmd*{\textleftdownfleuron}%
    {\vubth@drmsym{\symbol{'021}}}
  \newrobustcmd*{\textupleftfleuron}%
    {\vubth@drmsym{\symbol{'050}}}
  \newrobustcmd*{\textuprightfleuron}%
    {\vubth@drmsym{\symbol{'051}}}
  \newrobustcmd*{\textdownrightfleuron}%
    {\vubth@drmsym{\symbol{'077}}}
  \newrobustcmd*{\textdownleftfleuron}%
    {\vubth@drmsym{\symbol{'107}}}

  \newrobustcmd*{\textsquaretulip}%
    {\vubth@drmsym{\symbol{'023}}}
  \newrobustcmd*{\textsquaretulipside}%
    {\vubth@drmsym{\symbol{'046}}}
  \newrobustcmd*{\textupdoubletulip}%
    {\vubth@drmsym{\symbol{'024}}}
  \newrobustcmd*{\textdowndoubletulip}%
    {\vubth@drmsym{\symbol{'027}}}
  \newrobustcmd*{\textrightdoubletulip}%
    {\vubth@drmsym{\symbol{'036}}}
  \newrobustcmd*{\textleftdoubletulip}%
    {\vubth@drmsym{\symbol{'037}}}
  \newrobustcmd*{\textupleftcornertulip}%
    {\vubth@drmsym{\symbol{'053}}}
  \newrobustcmd*{\textuprightcornertulip}%
    {\vubth@drmsym{\symbol{'072}}}
  \newrobustcmd*{\textlowleftcornertulip}%
    {\vubth@drmsym{\symbol{'073}}}
  \newrobustcmd*{\textlowrightcornertulip}%
    {\vubth@drmsym{\symbol{'110}}}
  \newrobustcmd*{\textupsingletuliplong}%
    {\vubth@drmsym{\symbol{'111}}}
  \newrobustcmd*{\textdownsingletuliplong}%
    {\vubth@drmsym{\symbol{'112}}}
  \newrobustcmd*{\textleftsingletuliplong}%
    {\vubth@drmsym{\symbol{'113}}}
  \newrobustcmd*{\textrightsingletuliplong}%
    {\vubth@drmsym{\symbol{'114}}}
  \newrobustcmd*{\textupsingletulip}%
    {\vubth@drmsym{\symbol{'116}}}
  \newrobustcmd*{\textdownsingletulip}%
    {\vubth@drmsym{\symbol{'121}}}
  \newrobustcmd*{\textleftsingletulip}%
    {\vubth@drmsym{\symbol{'122}}}
  \newrobustcmd*{\textrightsingletulip}%
    {\vubth@drmsym{\symbol{'123}}}

  \newrobustcmd*{\spearright}%
    {\vubth@drmsym{\symbol{'124}}}
  \newrobustcmd*{\spearleft}%
    {\vubth@drmsym{\symbol{'125}}}

  \newrobustcmd*{\horizspearext}%
    {\vubth@drmsym{\symbol{'126}}}

  \newrobustcmd*{\spearup}%
    {\vubth@drmsym{\symbol{'132}}}
  \newrobustcmd*{\speardown}%
    {\vubth@drmsym{\symbol{'146}}}

  \newrobustcmd*{\vertspearext}%
    {\vubth@drmsym{\symbol{'147}}}

  \newrobustcmd*{\fleurdelis}%
    {\vubth@drmsym{\symbol{'157}}}
  \newrobustcmd*{\fleurdelys}%
```

```
  {\vubth@drmsym{\symbol{'157}}}

\newrobustcmd*{\fleurdelisdown}%
  {\vubth@drmsym{\symbol{'167}}}
\newrobustcmd*{\fleurdelysdown}%
  {\vubth@drmsym{\symbol{'167}}}
\newrobustcmd*{\fleurdelisleft}%
  {\vubth@drmsym{\symbol{'316}}}
\newrobustcmd*{\fleurdelysleft}%
  {\vubth@drmsym{\symbol{'316}}}
\newrobustcmd*{\fleurdelisright}%
  {\vubth@drmsym{\symbol{'177}}}
\newrobustcmd*{\fleurdelysright}%
  {\vubth@drmsym{\symbol{'177}}}

\newrobustcmd*{\woundcordleftext}%
  {\vubth@drmsym{\symbol{'317}}}
\newrobustcmd*{\woundcordrightext}%
  {\vubth@drmsym{\symbol{'324}}}
\newrobustcmd*{\woundcordleftend}%
  {\vubth@drmsym{\symbol{'320}}}
\newrobustcmd*{\woundcordrightend}%
  {\vubth@drmsym{\symbol{'321}}}
\newrobustcmd*{\woundcordleftendinv}%
  {\vubth@drmsym{\symbol{'323}}}
\newrobustcmd*{\woundcordrightendinv}%
  {\vubth@drmsym{\symbol{'322}}}

\newcommand*{\romanize}[1]%
  {\RedefineMRmdclxvij%
     {\romthousand}%
     {\romfivehundred}%
     {\romhundred}%
     {\romfifty}%
     {\romten}%
     {\romfive}%
     {\romone}%
     {\romone}%
   \nbshortroman{#1}}

\newcommand*{\tulipframe}[1]%
  {\vbox%
     {\hbox to \linewidth%
        {\hfil%
           {\textupleftcornertulip}%
           {\textupsingletuliplong}%
           {\textupdoubletulip}%
           {\textupsingletuliplong}%
           {\textuprightcornertulip}%
         \hfil}%
      \vskip -0.25\baselineskip% originally -0.5
      \hbox to \linewidth%
        {\hfil%
           #1%
         \hfil}%
      \vskip -0.5\baselineskip%
      \hbox to \linewidth%
        {\hfil%
           {\textlowleftcornertulip}%
           {\textdownsingletuliplong}%
           {\textdowndoubletulip}%
           {\textdownsingletuliplong}%
           {\textlowrightcornertulip}%
         \hfil}}}

\newcounter{vubth@erc}
\newcounter{vubth@erit}
\newlength{\vubth@ercharwidth}
\newlength{\vubth@erlcharwidth}
\newlength{\vubth@errcharwidth}
\newlength{\vubth@ergreaterwidth}

\newcommand*{\extrule}[5]%
  {\ifstrequal{#1}{h}%
     {\settowidth{\vubth@ercharwidth}{#5}
      \settowidth{\vubth@erlcharwidth}{#3}
      \settowidth{\vubth@errcharwidth}{#4}
      \defcounter{vubth@erc}%
        {(#2 - \vubth@erlcharwidth - \vubth@errcharwidth)
```

```
          / \vubth@ercharwidth}
      \noindent
      #3%
      \whileboolexpr%
        {test {\ifnumless{\value{vubth@erit}}{\value{vubth@erc}}}%
        {#5%
         \stepcounter{vubth@erit}}% to eliminate spurious space
      #4%
      % Global counter if \extrule is to be used inside groups
      \global\defcounter{vubth@erit}{\z@}}%
     {\ifstrequal{#1}{v}%
        {\settoheight{\vubth@erlcharwidth}{#3}
         \settodepth{\vubth@ergreaterwidth}{#3}
         \deflength{\vubth@erlcharwidth}%
           {\vubth@erlcharwidth + \vubth@ergreaterwidth}
         \settoheight{\vubth@errcharwidth}{#4}
         \settodepth{\vubth@ergreaterwidth}{#4}
         \deflength{\vubth@errcharwidth}%
           {\vubth@errcharwidth + \vubth@ergreaterwidth}
         \settoheight{\vubth@ercharwidth}{#5}
         \settodepth{\vubth@ergreaterwidth}{#5}
         \deflength{\vubth@ercharwidth}%
           {\vubth@ercharwidth + \vubth@ergreaterwidth}
         \ifdimgreater{\vubth@erlcharwidth}{\vubth@errcharwidth}%
           {\deflength{\vubth@ergreaterwidth}{\vubth@erlcharwidth}}%
           {\deflength{\vubth@ergreaterwidth}{\vubth@errcharwidth}}
         \ifdimgreater{\vubth@ercharwidth}{\vubth@ergreaterwidth}%
           {\deflength{\vubth@ergreaterwidth}{\vubth@ercharwidth}}%
           {}
         \defcounter{vubth@erc}%
           {(#2 - \vubth@erlcharwidth - \vubth@errcharwidth)
            / \vubth@ercharwidth}
         \noindent
         \vbox to \dimexpr #2\relax%
           {\deflength{\baselineskip}{\z@}
            \hbox to \vubth@ergreaterwidth%
              {\hfil%
                 #4%
               \hfil}
            \whileboolexpr%
              {test
                 {\ifnumless{\value{vubth@erit}}{\value{vubth@erc}}}%
              {\vss%
               \hbox to \vubth@ergreaterwidth%
                 {\hfil%
                    #5%
                  \hfil}%
               \stepcounter{vubth@erit}}
            \vss%
            \hbox to \vubth@ergreaterwidth%
              {\hfil%
                 #3%
               \hfil}
            % Global counter if \extrule is to be used inside groups
            \global\defcounter{vubth@erit}{\z@}}}
        {}}}

%-----------------------------------------------------------------------
% SPACING

% The `\setSingleSpace' command is meant to be used to adjust
% slightly the normal spacing between lines, perhaps because
% the font being used looks too crampled or loose.
% The effect is that the normal `\baselineskip' spacing will be
% multiplied by factor, which should be close to 1.0.
% Using `\setSingleSpace' will also reset the float
% and page note spacings.
% The declaration `\SingleSpacing' returns everthing to normal,
% or at least the setting from `\setSingleSpace' if it has been used.
% It will also reset float and page note spacings to the same value.
%\setSingleSpace{1.2}

% Only one space between sentences instead of two.
\frenchspacing

\ifbool{vubth@zeroparindent}%
  {\deflength{\parindent}{\z@}}%
  {}
```

```
\notbool{vubth@zeroparskip}%
  % Or \nonzeroparskip
  {\abnormalparskip%
     {\baselineskip \@plus .5\baselineskip \@minus .5\baselineskip}}%
  % Standard \traditionalparskip = \z@skip in kernel
  {}

\newcommand*{\bibsloppy}%
  {\tolerance=1414
   \hbadness=1414
   \emergencystretch=1.5em
   \hfuzz=.3\p@
   \widowpenalty=10000
   \vfuzz
   \hfuzz
   \raggedbottom}

%\brokenpenalty=1000% default 100
%\widowpenalty=1000% default 150
%\clubpenalty=1000% default 150

%-----------------------------------------------------------------------
% HYPERREF

\ifbool{draftdoc}%
  {\hypersetup%
     {colorlinks=true,% false voor boxes
      linkcolor=black,
      filecolor=black,
      citecolor=black,
      urlcolor=black}}% blue
  {\hypersetup{hidelinks}}

% General Hyperref Options
\hypersetup%
  {pdfhighlight=/O,% /I
   bookmarksnumbered=true,% false
   bookmarksopen=true,% false
   breaklinks=true,
   pdfpagemode=UseOutlines,% UseNone
   unicode=true}

% These settings only make sense
% at the begin of the document
\AtBeginDocument%
  {\hypersetup%
     {pdfinfo=%
        {Title={\@title},
         Author={\@author},
         Subject={\thesistype}}}}

%-----------------------------------------------------------------------
% MEMOIR

% APPEARANCE OF PAGE
% \raggedbottom
% \raggedbottomsection & \normalbottomsection
% om te korte pagina's te typesetten en de head
% op de vorige pagina te zetten zodat je geen
% raggedbottom in het algemeen hier moet zetten

% \flushbottom is de default voor twosided
% typesetting hiermee wordt iedere pagina even
% opgevuld

% PAGELAYOUT
\ifbool{vubth@forcea4page}%
  {\pageaiv
   \setpagecc%
     {\paperheight}%
     {\paperwidth}%
     {*}}%
  {}

\ifbool{vubth@isolayout}%
  % Other Predefined Layouts: \medievalpage \semiisopage
  {\isopage}%
  {% Orgininal Memoir Layout
   %\settrimmedsize%
```

```
    %  {11in}%
    %  {210mm}%
    %  {*}
    %\deflength{\trimtop}{\z@}
    %\deflength{\trimedge}{\stockwidth - \paperwidth}
    %\settypeblocksize%
    %  {7.75in}%
    %  {33pc}%
    %  {*}
    %\setulmargins%
    %  {4cm}%
    %  {*}%
    %  {*}
    %\setlrmargins%
    %  {1.25in}%
    %  {*}%
    %  {*}
    %\setmarginnotes%
    %  {17\p@}%
    %  {51\p@}%
    %  {\onelineskip}
    %\setheadfoot%
    %  {\onelineskip}%
    %  {2\onelineskip}
    %\setheaderspaces%
    %  {*}%
    %  {2\onelineskip}%
    %  {*}

    % Adapted Layout for A4
    %\settrimmedsize%
    %  {297mm}%
    %  {210mm}%
    %  {*}
    \deflength{\trimtop}{\z@}
    \deflength{\trimedge}{\stockwidth - \paperwidth}
    \settypeblocksize%
      {634\p@}%
      {448.13\p@}%
      {*}
    %\settypeblocksize%
    %  {7.75in}%
    %  {33pc}%
    %  {*}
    %\setulmargins%
    %  {4cm}%
    %  {*}%
    %  {*}
    \setulmargins%
      {*}%
      {*}%
      {*}
    %\setlrmargins%
    %  {*}%
    %  {*}%
    %  {1.5}
    \setlrmargins%
      {3.5cm}%
      {*}%
      {*}
    %\setmarginnotes%
    %  {9\p@}%
    %  {41\p@}%
    %  {\onelineskip}
    \setheadfoot%
      {\onelineskip}%
      {3\onelineskip}
    \setheaderspaces%
      {*}%
      {1.5\onelineskip}%
      {*}}

\checkandfixthelayout

% TO CHANGE LAYOUT MIDDOCUMENT
%\cleardoublepage
%\medievalpage
%\checkandfixthelayout
%\ch@ngetext
```

```
% TRIMMARKS
\quarkmarks

% GATHERINGS
%\leavespergathering{2}% pages mod 4 = 0

% PAGECHECK
\strictpagecheck

% EPIGRAPH
\deflength{\beforeepigraphskip}{\z@}% 2\baselineskip
\deflength{\afterepigraphskip}{\z@}% 4\baselineskip
\deflength{\epigraphwidth}{.45\textwidth}% .4\textwidth
%\deflength{\epigraphrule}{.75\p@}
%\epigraphfontsize{\footnotesize}
\epigraphposition{flushright}
\epigraphtextposition{flushleftright}
\epigraphsourceposition{flushright}

% APPENDIX HEADER FOR TABLE OF CONTENTS
%\renewcommand*{\cftappendixname}{\appendixname\space}

% HEADSTYLE
\headstyles{ntglike}% of memman
% Use \setaftersubparaskip{.01\onelineskip}
% or .333\onelineskip \@plus .1\onelineskip,
% a negative value for a runin heading with
% S = paragraph, section, ... default -1em
%\setafterparaskip{.01\onelineskip}

% NUMBERING
\settocdepth{subsubsection}
% Or \maxtocdepth{subsubsection}.
% ps: \maxsecnumdepth{subsection} is called by the
% previous command, \frontmatter sets numdepth to zero.
\setsecnumdepth{subsubsection}
% The macro \hangsecnum is a declaration that makes
% sectional numbers hang in the margin.
% The macro \defaultsecnum is a declaration that reverses
% the effect of \hangsecnum, that is, sectional numbers
% will be typeset in their familiar places.
%\hangsecnum

% LISTS
% Put \noprelistbreak before lists: i.e.
%\noprelistbreak
%\begin{itemize}
% ..............
%\end{itemize}
% to prevent the start of a new page
%\firmlists*% (used to be active in the class).

% TABLE & ARRAY
% General stretch switch
%\renewcommand*{\arraystretch}%
%  {1.2}% or 1.3
% A more controlled approach
% Remember that the default value for `\arraystretch'
% in the LaTeX kernel is 1.
% Note: we do not redefine tabular or array by prepending
% the `\arraystretch' code to the environments. I.e., we
% want the user to be able to choose between the standard
% implementation and the class variant. This choice was
% made also to avoid unwanted effects by code calling the
% original implementation. Also, our code is immune to
% changes made by other code to `\arraystretch'.
\newcommand*{\vubthtabularstretch}%
  {1.2}
\newenvironment*{vubtharray}[1][\vubthtabularstretch]%
  {\renewcommand*{\arraystretch}%
     {#1}%
   \begin{array}}%
  {\end{array}}
\newenvironment*{vubthtabular}[1][\vubthtabularstretch]%
  {\renewcommand*{\arraystretch}%
     {#1}%
   \begin{tabular}}%
  {\end{tabular}}
```

```
\newenvironment*{vubthtabular*}[1][\vubthtabularstretch]%
  {\renewcommand*{\arraystretch}%
     {#1}%
   \begin{tabular*}}%
  {\end{tabular*}}
\newenvironment*{vubthtabu}[1][\vubthtabularstretch]%
  {\tabulinesep=\dimexpr#1\onelineskip - \onelineskip\relax
   \begin{tabu}}%
  {\end{tabu}}
\newenvironment*{vubthlongtabu}[1][\vubthtabularstretch]%
  {\tabulinesep=\dimexpr#1\onelineskip - \onelineskip\relax
   \begin{longtabu}}%
  {\end{longtabu}}

% CAPTION
% By default the name and title of a caption are typeset as
% a block (non-indented) paragraph.
% \captionstyle can be used to alter this.
% Sensible values for style are: \centering, \raggedleft or
% \raggedright for styles corresponding to these declarations.
% The \centerlastline style gives a block paragraph but with
% the last line centered.
% The class initially specifies
% \captionstyle{} to give the normal block paragraph style.
% If a caption is less than one line in length it may look odd if
% the style is \raggedright, say, as it will be left justified.
% The optional short argument to \captionstyle can be used to
% specify the style for such short captions if it should differ
% from that for multiline captions.
%\captionstyle%
%  [\centering]%
%  {\raggedright}
% The declaration \hangcaption causes captions to be typeset with
% the second and later lines of a multiline caption title indented
% by the width of the caption name.
% The declaration \indentcaption will indent title lines after
% the first by length.
% These commands are independent of the \captionstyle{...}
% and have no effect on short captions.
% Note that a caption will not be simultaneously hung and indented.
% The \normalcaption declaration undoes any previous \hangcaption
% or \indentcaption declaration.
% The class initially specifies \normalcaption to give the normal
% non-indented paragraph style.
%\hangcaption
% These commands will draw a horizontal line above
% and below the captions.
%\precaption%
%  {\rule%
%     {\linewidth}%
%     {\normalrulethickness}%
%   \par}
%\postcaption%
%  {\rule%
%     {\linewidth}%
%     {\normalrulethickness}}
% Used to end captions
\captiontitlefinal{.}
% Subcaption style
\loosesubcaptions

% FLOATS
% Block floats from moving past the next \section command.
\setFloatBlockFor{section}
% Change the space between a `here' float and its
% surroundings. This includes both above and below
% space. Ideally this would be set on a float type basis,
% but the `setfloatadjustment' method comes too late
% for this. In `\setfloatadjustment' we can only change
% parameters inside the float environment, not its
% surroundings. We provide two commands for
% in document switching.
\newcommand*{\nointextsep}%
  {\deflength{\intextsep}{\z@ \@plus 2\p@}}
\newcommand*{\defaultintextsep}%
  {\deflength{\intextsep}{12\p@ \@plus 2\p@ \@minus 2\p@}}
% Same as above but for single column `top' and `bottom'
% floats. `floatsep' controls the space between two floats,
% and `textfloatsep' controls the space between a float
```

```
% and the surrounding text.
%\deflength{\floatsep}{\z@}
%\deflength{\textfloatsep}{\z@}

% FIGURE & TABLE
% We renew the definition of `listfigurename' and
% `listtablename' in order to ensure the use of the
% dutch digraph `ij'.
\notbool{vubth@englishlang}%
  {\renewcommand*{\listfigurename}%
     {L\ij st van figuren}
   \renewcommand*{\listtablename}%
     {L\ij st van tabellen}}%
  {}

%\renewenvironment{figure}%
%  {\deflength{\abovecaptionskip}{\onelineskip}
%   \deflength{\belowcaptionskip}{\z@}
%   \@float{figure}}%
%  {\end@float}
%\renewenvironment{figure*}%
%  {\deflength{\abovecaptionskip}{\onelineskip}
%   \deflength{\belowcaptionskip}{\z@}
%   \@dblfloat{figure}}%
%  {\end@dblfloat}
%\renewenvironment{table}%
%  {\deflength{\abovecaptionskip}{\z@}
%   \deflength{\belowcaptionskip}{1.25\onelineskip}
%   \@float{table}}%
%  {\end@float}
%\renewenvironment{table*}%
%  {\deflength{\abovecaptionskip}{\z@}
%   \deflength{\belowcaptionskip}{1.25\onelineskip}
%   \@dblfloat{table}}%
%  {\end@dblfloat}
\hypcapredef{figure}
\hypcapredef{figure*}
\setfloatadjustment{figure}%
  {\deflength{\abovecaptionskip}{\onelineskip}
   \deflength{\belowcaptionskip}{\z@}
   \centering}

\hypcapredef{table}
\hypcapredef{table*}
\setfloatadjustment{table}%
  {\deflength{\abovecaptionskip}{\z@}
   \deflength{\belowcaptionskip}{\onelineskip}
   \centering}

% In body text
%\contcaption{Continued}

\newcommand*{\cftonlycaption}[2][]%
  {\begingroup
     \let\@makecaption\@gobbletwo% ok
     \ifstrempty{#1}%
       {\caption{#2}}%
       {\caption%
          [#1]%
          {#2}}
   \endgroup}

% CHAPTERSTYLE VZ43
\newtoggle{vubth@vzchapnumber}
\newlength{\vubth@vztitle}
\newcounter{vubth@vzindex}

\makechapterstyle{vzfourthree}%
  {\deflength{\midchapskip}{\z@}
   \deflength{\vubth@vztitle}{\textwidth - 3cm}
   \renewcommand*{\chapternamenum}%
     {}
   \renewcommand*{\printchaptername}%
     {}
   \renewcommand*{\printchapternum}%
     {\toggletrue{vubth@vzchapnumber}}
   \renewcommand*{\chapnumfont}%
     {\Huge
      \bfseries
```

```
      \centering}
   \renewcommand*{\chaptitlefont}%
     {\Huge
      \bfseries
      \raggedright}
   \renewcommand*{\printchaptertitle}[1]%
     {\whileboolexpr%
        {test {\ifnumless{\value{vubth@vzindex}}{7}}}%
        {\rule%
           [-2cm]%
           {\p@}%
           {5cm}%
         \hspace{1mm}%\relax
         \stepcounter{vubth@vzindex}}
      \global\defcounter{vubth@vzindex}{\z@}
      \hspace*{-2em}%
      \begin{tabular}{@{}p{1cm}p{\vubth@vztitle}}
        \iftoggle{vubth@vzchapnumber}%
          {\colorbox{black}%
            {\color{white}
             \makebox%
               [.8cm]%
               {\chapnumfont
                \strut%
                \thechapter}}%
          {}
        & \chaptitlefont ##1
      \end{tabular}}
   \renewcommand*{\printchapternonum}%
     {\togglefalse{vubth@vzchapnumber}}}

% CHAPTERSTYLE DALEIF1
\newlength{\vubth@daleifh}
\newlength{\vubth@daleifd}
\newsavebox{\vubth@feline@chapter}

\newcommand*{\vubth@feline@chapter@marker}[1][4cm]%
  {\sbox{\vubth@feline@chapter}%
     {\resizebox%
       {!}%
       {#1}%
       {\deflength{\fboxsep}{\p@}%
        \colorbox%
          {nicered}%
          {\color{white}
           \bfseries
           \fontfamily{mdput}%
           \selectfont
           \thechapter}}}%
   \settoheight{\vubth@daleifh}{\usebox{\vubth@feline@chapter}}
   \settodepth{\vubth@daleifd}{\usebox{\vubth@feline@chapter}}
   \deflength{\vubth@daleifh}{\vubth@daleifh + \vubth@daleifd}
   \rotatebox%
     {90}%
     {\resizebox%
        {\vubth@daleifh}%
        {!}%
        {\textsc{\so\@chapapp}}}%
   \quad%
   \raisebox%
     {\vubth@daleifd}%
     {\usebox{\vubth@feline@chapter}}}

\newcommand*{\vubth@feline@chm}[1][4cm]%
  {\sbox{\vubth@feline@chapter}%
     {\vubth@feline@chapter@marker[#1]}
   \makebox%
     [\z@]%
     [l]%
     {\makebox%
        [1cm]%
        [r]%
        {\usebox{\vubth@feline@chapter}}}}

\makechapterstyle{daleifone}%
  {\renewcommand*{\chapnamefont}%
     {\normalfont
      \Large
      \scshape
```

```
      \raggedleft
      \so}
   \renewcommand*{\chaptitlefont}%
     {\normalfont
      \huge
      \bfseries
      \scshape
      \color{nicered}}
   \renewcommand*{\chapternamenum}%
     {}
   \renewcommand*{\printchaptername}%
     {}
   \renewcommand*{\printchapternum}%
     {\null
      \hfill
      \vubth@feline@chm[2.5cm]%
      \par}
   \renewcommand*{\afterchapternum}%
     {\par
      \vspace{\midchapskip}}
   \renewcommand*{\printchaptertitle}[1]%
     {\chaptitlefont
      \raggedleft
      ##1%
      \par}}

% CHAPTERSTYLE STUARTBOX
\makechapterstyle{stuartbox}%
  {\renewcommand*{\printchaptername}%
     {}
   \renewcommand*{\chapnumfont}%
     {\normalfont
      \sffamily
      \huge
      \bfseries}
   \renewcommand*{\printchapternum}%
     {\raggedleft
      \begin{tikzpicture}
        \draw[fill,color=black] (0,0) rectangle (2cm,2cm);
        \draw[color=white] (1cm,1cm) node {\chapnumfont\thechapter};
      \end{tikzpicture}}
   \renewcommand*{\chaptitlefont}%
     {\normalfont
      \sffamily
      \Huge
      \bfseries}
   \renewcommand*{\printchaptertitle}[1]%
     {\raggedleft
      \chaptitlefont
      ##1}}

% VUBTHESIS CHAPTERSTYLE
\makechapterstyle{vubthesis}%
  {\deflength{\afterchapskip}{40\p@}
   \renewcommand*{\chapterheadstart}%
     {\vspace*{40\p@}}
   \renewcommand*{\afterchapternum}%
     {\par
      \nobreak
      \vspace{25\p@}}
   \renewcommand*{\chapnamefont}%
     {\normalfont
      \LARGE
      \raggedleft}
   \renewcommand*{\chapnumfont}%
     {\fontspec{\mainfontname}
      \HUGE}
   \renewcommand*{\chaptitlefont}%
     {\normalfont
      \HUGE
      \bfseries
      \raggedleft}
   \renewcommand*{\printchaptername}%
     {\chapnamefont
      \MakeTextUppercase{\@chapapp}}
   \renewcommand*{\chapternamenum}%
     {}
   % \beforechapskip = \numberheight
   \deflength{\beforechapskip}{18mm}
```

```
    % \midchapskip = \barlength
    \deflength{\midchapskip}{\paperwidth - \textwidth - \spinemargin}
    \renewcommand*{\printchapternum}%
      {\hspace{.8em}%
       \resizebox%
         {!}%
         {\beforechapskip}%
         {\chapnumfont \thechapter}%
       \hspace{.8em}%
       \rlap%
         {\rule%
            {\midchapskip}%
            {\beforechapskip}}}}

% CHAPTERSTYLE
\chapterstyle{vubthesis}

% PAGESTYLE
\makepagestyle{vubthesis}
\makepagestyle{vubthesischappagestyle}

\newcommand*{\vubth@headfootstyle}%
  {\textsc}
\newcommand*{\vubth@headfootdraftstyle}%
  {\textit}

\ifbool{vubth@englishlang}%
  {\newcommand*{\vubth@headerdraftmark}%
     {Draft}
   \newcommand*{\vubth@footerdraftmark}%
     {Draft:
      \begingroup%
        \DTMsetstyle{vubthamerican}%
        \DTMtoday{}
      \endgroup%
      at
      \printtime*}}%
  {\newcommand*{\vubth@headerdraftmark}%
     {Ontwerp}
   \newcommand*{\vubth@footerdraftmark}%
     {Ontwerp:
      \begingroup%
        \DTMsetstyle{vubthdutch}%
        \DTMtoday{}
      \endgroup%
      om
      \printtime}}

\ifbool{vubth@headersecatedge}%
  {\ifbool{draftdoc}%
    {\makeevenhead{vubthesis}%
       {\vubth@headfootstyle{\leftmark}}%
       {}%
       {\vubth@headerdraftmark}
     \makeoddhead{vubthesis}%
       {\vubth@headerdraftmark}%
       {}%
       {\vubth@headfootstyle{\leftmark}}}%
    {\makeevenhead{vubthesis}%
       {\vubth@headfootstyle{\leftmark}}%
       {}%
       {}
     \makeoddhead{vubthesis}%
       {}%
       {}%
       {\vubth@headfootstyle{\leftmark}}}}
  {\ifbool{draftdoc}%
    {\makeevenhead{vubthesis}%
       {\vubth@headfootstyle{\rightmark}}%
       {}%
       {\vubth@headerdraftmark}
     \makeoddhead{vubthesis}%
       {\vubth@headerdraftmark}%
       {}%
       {\vubth@headfootstyle{\rightmark}}}%
    {\makeevenhead{vubthesis}%
       {\vubth@headfootstyle{\rightmark}}%
       {}%
       {}
```

```
    \makeoddhead{vubthesis}%
      {}%
      {}%
      {\vubth@headfootstyle{\rightmark}}}}

\ifbool{draftdoc}%
  {\makeevenfoot{vubthesis}%
     {\thepage}%
     {}%
     {\vubth@footerdraftmark}
   \makeoddfoot{vubthesis}%
     {\vubth@footerdraftmark}%
     {}%
     {\thepage}
   \makeoddfoot{vubthesischappagestyle}%
     {\vubth@footerdraftmark}%
     {}%
     {\thepage}}%
  {\makeevenfoot{vubthesis}%
     {\thepage}%
     {}%
     {}
   \makeoddfoot{vubthesis}%
     {}%
     {}%
     {\thepage}
   \makeoddfoot{vubthesischappagestyle}%
     {}%
     {}%
     {\thepage}}

\makeheadrule{vubthesis}%
  {\textwidth}%
  {\normalrulethickness}
\makefootrule{vubthesis}%
  {\textwidth}%
  {\normalrulethickness}%
  {\footruleskip}
\makefootrule{vubthesischappagestyle}%
  {\textwidth}%
  {\normalrulethickness}%
  {\footruleskip}

\newcommand*{\vubth@marks}%
  {\nouppercaseheads
   \createmark{chapter}%
     {right}%
     {shownumber}%
     {\@chapapp\space}%
     {. \space}
   \createmark{section}%
     {left}%
     {shownumber}%
     {}%
     {. \space}
   \createmark{subsection}%
     {left}%
     {shownumber}%
     {}%
     {. \space}
   \createplainmark{toc}%
     {both}%
     {\contentsname}
   \createplainmark{lof}%
     {both}%
     {\listfigurename}
   \createplainmark{lot}%
     {both}%
     {\listtablename}}

\makepsmarks{vubthesis}%
  {\vubth@marks}

%\makeheadfootstrut{vubthesis}%
%  {\sbox0{\bfseries0123456789}%
%   \raisebox%
%     {\z@}%
%     [\ht0]%
%     [\dimexpr\headheight-\ht0-\normalrulethickness\relax]%
```

```
%    {}%
%  {\strut}

\pagestyle{vubthesis}% companion, showlocs
\aliaspagestyle{chapter}{vubthesischappagestyle}

% LEADPAGE
\ifbool{vubth@englishlang}%
  {\newleadpage{frontmatterpage}%
     {Front Matter}
   \newleadpage{mainmatterpage}%
     {Main Matter}
   \newleadpage{backmatterpage}%
     {Back Matter}}%
  {\newleadpage{frontmatterpage}%
     {Voorwerk}
   \newleadpage{mainmatterpage}%
     {Hoofdgedeelte}
   \newleadpage{backmatterpage}%
     {Nawerk}}

% PARTSTYLE
\renewcommand{\parttitlefont}%
  {\normalfont
   \HUGE% or \Huge
   \bfseries}
\aliaspagestyle{part}{empty}

% MARGINHEADING
\newcommand{\marginbox}[1]%
  {\parbox%
     [t]%
     [\z@]%
     {6em}%
     {\itshape
      \raggedleft
      \leavevmode
      #1}}
\newcommand{\marginhead}[1]%
  {\begingroup
     \llap%
       {\marginbox{#1}
        \kern.5em}
   \endgroup}
%\setparaindent{\z@}
%\setafterparaskip{\z@}
%\setparaheadstyle{\marginhead}
%\setparahook%
%  {\setsecnumformat%
%     {\csuse{the##1}%
%      \space}}
%\paragraph{Hang the whole heading in the margin}

% CARDINALS & ORDINALS
%\renewcommand*{\fnumbersep}%
%  {.}
%\renewcommand{\ordscript}[1]%
%  {\textsuperscript{#1}}

% FANCYBREAK
\newcommand*{\starbreak}%
  {\fancybreak%
     {*%
      \quad%
      *%
      \quad%
      *}}

\newcommand*{\fancyleafs}%
  {\fancybreak%
     {\ding{167}%
      \quad%
      \ding{167}%
      \quad%
      \ding{167}}}

\newcommand*{\originalmemoirbreak}%
  {\fancybreak%
     {{*}%
```

```
      \\%
      {* * *}%
      \\%
      {*}}}
\newcommand*{\leafbreak}%
  {\fancybreak%
     {\begingroup
        \fontencoding{TS1}%
        \fontfamily{lmr}%
        \selectfont%
        \textleaf%
        \\%
        \textleaf%
        \hspace{.75cm}%
        \textleaf%
        \\%
        \textleaf%
      \endgroup}}

% Line of diamonds
\newcommand{\motif}[1]%
  {\cleaders%
   \mbox{#1}%
   \hfil}
\newcommand{\chain}[2]%
  {\makebox%
     [#2]%
     {\motif{#1}}}
\newcommand*{\diamonds}%
  {\m@th%
   \(%
   \mkern -.6mu%
   \diamond%
   \mkern -.6mu%
   \)}
%\fancybreak%
%  {\chain%
%     {\diamonds}%
%     {.25\textwidth}}

% BOXES
% Roundedframe
\newenvironment{roundedframe}%
  {\renewcommand{\FrameCommand}%
     {\cornersize*{20pt}%
      \deflength{\fboxsep}{5pt}%
      \ovalbox}%
   \MakeFramed%
     {\deflength{\hsize}{\hsize - \width}
      \FrameRestore}}%
  {\endMakeFramed}

% Framewithtitle
\ifbool{vubth@englishlang}%
  {\newcommand*{\vubth@conttitle}%
     {\vubth@FrameFirst@Lab%
      \ %
      (cont.)}}%
  {\newcommand*{\vubth@conttitle}%
     {\vubth@FrameFirst@Lab%
      \ %
      (vervolg)}}

\newcommand*{\vubth@FWTFrameTitle}[2]%
  {\deflength{\fboxrule}{\FrameRule}
   \deflength{\fboxsep}{\FrameSep}
   \fbox%
     {\vbox%
        {\nobreak
         \vspace{-0.7\FrameSep}
         \rlap%
           {\strut%
            #1}% left justified
         %\rlap%
         %  {\centerline%
         %     {\strut%
         %      #1}}% centered
         \nobreak
         \nointerlineskip
```

```
          \vspace{0.7\FrameSep}
          \mbox{#2}}}}

\newenvironment{framewithtitle}[2][\vubth@conttitle]%
  {\newcommand*{\vubth@FrameFirst@Lab}%
     {\textbf{#2}}%
   \newcommand*{\vubth@FrameCont@Lab}%
     {\textbf{#1}}%
   \renewcommand{\FrameCommand}[1]%
     {\vubth@FWTFrameTitle%
        {\vubth@FrameFirst@Lab}%
        {##1}}%
   \renewcommand{\FirstFrameCommand}[1]%
     {\vubth@FWTFrameTitle%
        {\vubth@FrameFirst@Lab}%
        {##1}}%
   \renewcommand{\MidFrameCommand}[1]%
     {\vubth@FWTFrameTitle%
        {\vubth@FrameCont@Lab}%
        {##1}}%
   \renewcommand{\LastFrameCommand}[1]%
     {\vubth@FWTFrameTitle%
        {\vubth@FrameCont@Lab}%
        {##1}}%
   \MakeFramed%
     {\deflength{\hsize}{\hsize - \width}
      \FrameRestore}}%
{\endMakeFramed}

% Titledframe
\newcommand*{\vubth@TFTitleFrame}[2]%
  {\deflength{\fboxrule}{\FrameRule}
   \deflength{\fboxsep}{\FrameSep}
   \vbox%
     {\nobreak
      \vspace{-0.7\FrameSep}
      \rlap%
        {\strut%
         #1}% left justified
      %\rlap%
      %  {\centerline%
      %     {\strut%
      %      #1}}% centered
      \nobreak
      \nointerlineskip
      \vspace{0.7\FrameSep}
      \noindent
      \fbox{#2}}}

\newenvironment{titledframe}[2][\vubth@conttitle]%
  {\newcommand*{\vubth@FrameFirst@Lab}%
     {\textbf{#2}}%
   \newcommand*{\vubth@FrameCont@Lab}%
     {\textbf{#1}}%
   \renewcommand{\FrameCommand}[1]%
     {\vubth@TFTitleFrame%
        {\vubth@FrameFirst@Lab}%
        {##1}}%
   \renewcommand{\FirstFrameCommand}[1]%
     {\vubth@TFTitleFrame%
        {\vubth@FrameFirst@Lab}%
        {##1}}%
   \renewcommand{\MidFrameCommand}[1]%
     {\vubth@TFTitleFrame%
        {\vubth@FrameCont@Lab}%
        {##1}}%
   \renewcommand{\LastFrameCommand}[1]%
     {\vubth@TFTitleFrame%
        {\vubth@FrameCont@Lab}%
        {##1}}%
   \MakeFramed%
     {\deflength{\hsize}{\textwidth - 2\FrameRule - 2\FrameSep}
      \FrameRestore}}%
  {\endMakeFramed}

%-------------------------------------------------------------------------
% MATHEMATICS

% HEREHERE
```

```
% \vubth@lod needs to be fully expanded because it is used
% inside bookmarks. When we use \newrobustcmd or
% \newrobustcmd we either get ``List of'' or ``'' as the
% bookmarktitle, or we get compilation errors.
% This problem especially creeps up in a `final' build.
\ifbool{vubth@englishlang}%
  {\newcommand*{\vubth@definition}{definition}
   \newcommand*{\vubth@definitions}{\vubth@definition s}
   \newcommand*{\vubth@theorem}{theorem}
   \newcommand*{\vubth@theorems}{\vubth@theorem s}
   \newcommand*{\vubth@lod}{List of Definitions}}%
  {\newcommand*{\vubth@definition}{definitie}
   \newcommand*{\vubth@definitions}{\vubth@definition s}
   \newcommand*{\vubth@theorem}{stelling}
   \newcommand*{\vubth@theorems}{\vubth@theorem en}
   \newcommand*{\vubth@lod}{L\ij st van Definities}}

% STYLE
\declaretheoremstyle%
  [spaceabove=\z@,% \onelineskip or default 6\p@
   spacebelow=\z@,
   headfont=\normalfont\bfseries,
   notefont=\mdseries,
   notebraces={(}{)},
   bodyfont=\normalfont,
   headindent=\z@,
   headpunct=:,% \colon
   %headformat=%
   %  {\makebox[\z@][r]{\NAME\ \NUMBER\ }\hskip-\spacelength{\NOTE}},
   postheadspace=.5em,% 1em
   %qed=\qedsymbol voor stelling
   %headformat=swapnumber,
   thmbox=M]{vubthesis}

% TYPES OF THEOREMS
\declaretheorem%
  [name=\xmakefirstuc{\vubth@definition},
   refname={\vubth@definition,\vubth@definitions},
   Refname={\xmakefirstuc{\vubth@definition},\emakefirstuc{\vubth@definitions}},
   % parent can also be placed in \declaretheoremstyle,
   % if same for all \declaretheorem.
   parent=chapter,
   style=vubthesis]{definition}

\declaretheorem%
  [name=\xmakefirstuc{\vubth@theorem},
   refname={\vubth@theorem,\vubth@theorems},
   Refname={\xmakefirstuc{\vubth@theorem},\emakefirstuc{\vubth@theorems}},
   parent=chapter,% see definition
   % numbered is unless unique or no do not work with thmbox
   % is this feature is required, comment out the parent and
   % style key. Parent needs to be commented out because this
   % key implies numbering.
   %numbered=unless unique,
   style=vubthesis]{theorem}

% THMBOX
\thmboxoptions%
  {style=M,
   cut=true,
   underline=true,
   headstyle=\bfseries\boldmath#1 #2,
   titlestyle=\space(#1),
   bodystyle=\noindent,
   leftmargin=\parindent,
   rightmargin=\z@,
   hskip=.4em,
   vskip=.4em,
   thickness=.6\p@}% or \normalrulethickness (.4\p@)

% MATH MACROS
\newcommand*{\derivationfrac}[2]%
  {\genfrac{}{}{}{\z@}{#1}{#2}}

\newcommand*{\mathsc}[1]%
  {\begingroup
     \normalfont
     \textsc{#1}
```

```
    \endgroup}

%\newcommand*{\atbinoper}{\mathbin{@}}

\allowdisplaybreaks[1]
%\deflength{\jot}{10\p@}

% LISTOF DEFINITIONS
\newlistof{listofdefinitions}%
  {lod}%
  {\vubth@lod}

% Float
\newfloat[chapter]{ftdefinition}%
  {lod}%
  {\xmakefirstuc{\vubth@definition}}
\newsubfloat{ftdefinition}

\ifbool{draftdoc}%
  {\NagDeclareFloat{ftdefinition}}%
  {}

% Appearance
\defcounter{loddepth}{2}
\setfloatlocations{ftdefinition}%
  {htbp}% !htbp
\newlistentry[chapter]{ftdefinition}%
  {lod}%
  {\z@}
\newlistentry[chapter]{definition}%
  {lod}%
  {\z@}
\cftsetindents{ftdefinition}%
  {\z@}%
  {3em}% Original 2.3em
\cftsetindents{definition}%
  {\z@}%
  {3em}% Original 2.3em
\cftsetindents{subftdefinition}%
  {3em}%
  {3.9em}
% `\ftcftdefinitioncaption' is useful in ftdefinition where
% we only want to place a caption in the cft and not in the
% main text.
% Piggy bag the ftdefinition list entry setup in order to
% directly add a lod definition entry without the use of a float.
% This configuration lets ftcftdefinitioncaption entries and
% cftdefinitioncaption entries look exactly alike.
% Ps. `ftcftdefinitioncaption' points to the begin of the float.
% Ps2. Better use `ftcftdefinitioncaption' before definition,
%      but `cftdefinitioncaption' must be used after.
% Ps3. No `\phantomsection' needed because we want to link to
%      the label issued by `definition' and not to the place where
%      this command is issued. I.e. we would jump to this location
%      by adding a virtual unnumbered section to the document.
\newcommand*{\ftcftdefinitioncaption}[1]%
  {\refstepcounter{ftdefinition}
   \addcontentsline%
     {lod}%
     {ftdefinition}%
     {\protect%
      \numberline{\theftdefinition}{\ignorespaces #1}}}
% Same as `\ftcftdefinitioncaption' but for fixed definitions.
\newcommand*{\cftdefinitioncaption}[1]%
  {\addcontentsline%
     {lod}%
     {definition}%
     {\protect%
      \numberline{\thedefinition}{\ignorespaces #1}}
   % check whether we must increase the ftdefinition counter
   % must be done after `addcontentsline' otherwise the label
   % points to a `ftdefinition' instead a `definition', i.e.
   % `refstepcounter' makes a new label active.
   \ifboolexpr%
     {test {\ifdefstring{\@currenvir}{ftdefinition}}
      or
      test {\ifdefstring{\@currenvir}{ftdefinition*}}}%
     {}%
     {\stepcounter{ftdefinition}}}
```

```
\addtocontents{lod}{\hspace*{\fill}\textbf{\pagename}\par}
\addtodef*{\insertchapterspace}%
  {}%
  {\addtocontents{lod}{\protect\addvspace{10\p@}}}

\addtodef{\@memfront@floats}%
  {}%
  {\counterwithout{ftdefinition}{chapter}}
\addtodef{\@memmain@floats}%
  {}%
  {\counterwithin{ftdefinition}{chapter}}
\addtodef{\@memback@floats}%
  {}%
  {\counterwithout{ftdefinition}{chapter}
   \defcounter{ftdefinition}{\z@}}

\addtopsmarks{vubthesis}%
  {}%
  {\createplainmark{lod}%
     {both}%
     {\vubth@lod}}

%\AtEndDocument{\addtocontents{lod}{\par}}

% Caption
%\renewenvironment{ftdefinition}%
%  {\deflength{\abovecaptionskip}{\z@}
%   \deflength{\belowcaptionskip}{\z@}
%   \@float{ftdefinition}}%
%  {\end@float}
%\renewenvironment{ftdefinition*}%
%  {\deflength{\abovecaptionskip}{\z@}
%   \deflength{\belowcaptionskip}{\z@}
%   \@dblfloat{ftdefinition}}%
%  {\end@dblfloat}
\hypcapredef{ftdefinition}
\hypcapredef{ftdefinition*}
\setfloatadjustment{ftdefinition}%
  {\deflength{\abovecaptionskip}{\onelineskip}
   \deflength{\belowcaptionskip}{\z@}}

% Cleveref setup
% The definition of `definition' should be done by cleveref
% but it gets overwritten somewhere apparently
% default definition: definition (english), definitie (dutch)
\ifbool{vubth@capitalizecref}%
  {\crefname{definition}%
     {\xmakefirstuc{\vubth@definition}}%
     {\emakefirstuc{\vubth@definitions}}}%
  {\crefname{definition}%
     {\vubth@definition}%
     {\vubth@definitions}}
\Crefname{definition}%
  {\xmakefirstuc{\vubth@definition}}%
  {\emakefirstuc{\vubth@definitions}}
\ifbool{vubth@capitalizecref}%
  {\crefname{ftdefinition}%
     {\xmakefirstuc{\vubth@definition}}%
     {\emakefirstuc{\vubth@definitions}}}%
  {\crefname{ftdefinition}%
     {\vubth@definition}%
     {\vubth@definitions}}
\Crefname{ftdefinition}%
  {\xmakefirstuc{\vubth@definition}}%
  {\emakefirstuc{\vubth@definitions}}
% Override the default cleveref definition of theorem in dutch
% i.e. theorema, with our word `stelling'.
\ifbool{vubth@capitalizecref}%
  {\crefname{theorem}%
     {\xmakefirstuc{\vubth@theorem}}%
     {\emakefirstuc{\vubth@theorems}}}%
  {\crefname{theorem}%
     {\vubth@theorem}%
     {\vubth@theorems}}
\Crefname{theorem}%
  {\xmakefirstuc{\vubth@theorem}}%
  {\emakefirstuc{\vubth@theorems}}
```

```
%-----------------------------------------------------------------------
% GRAPHICS CONFIGURATIONS

\DeclareGraphicsExtensions{.pdf,.png,.jpg}

% A note from http://www.ctan.org/pkg/l2tabu-english
% There are several reasons why you should avoid the \graphicspath macro.
% Replace it by setting environment variable TEXINPUTS:
% 1. There are different seperators in path names on different platforms.
% While MS Windows and Unices both use a slash '/', a colon ':' is used
% on Macintosh systems.
% 2. TEX search takes longer than with using the kpathsea library
% (with today's fast chips this is not as important an argument
% as it used to be).
% 3. TEX's memory is limited, and every picture uses part of this memory.
% What's more, memory is not cleared during the compiling process.
% In a Bourne shell use
% $ TEXINPUTS=PictureDir:$TEXINPUTS latex datei.tex
% or add to ~/.profile
% export TEXINPUTS=./PictureDir:$TEXINPUTS
% In the latter case the files in PictureDir
% will be found within the current working directory.
% Up to MS Windows 98 the environment variable is set by adding
% set TEXINPUTS=.\PictureDir;%TEXINPUTS%
% to your autoexec.bat.
% On MS Windows NT-based systems according to the
% 'Microsoft Knowledge Base' the variable can be set by right clicking at
% My Computer -> System Properties -> Advanced -> Environment variables.
% The above are only some suggestions on how to proceed.
% I am well aware that TEXINPUTS may be set in different ways.
% Please see the documentation of your operating system, or of your
% TEX distribution for more.
\ifbool{vubth@graphicspath}%
  {\graphicspath{{./images/}}}%
  {}

%-----------------------------------------------------------------------
% LETTRINE

% Number of lines that the letter spans.
%\defcounter{DefaultLines}{4}
% No rest of word shape alternation.
% Default is \scshape.
\renewcommand*{\LettrineTextFont}%
  {}

%-----------------------------------------------------------------------
% MINTED/LISTINGS

% \vubth@lol see explanation at \vubth@lod.
\ifbool{vubth@englishlang}%
  {\newcommand*{\vubth@listing}{listing}
   \newcommand*{\vubth@listings}{\vubth@listing s}
   \newcommand*{\vubth@lol}{List of Listings}}%
  {\newcommand*{\vubth@listing}{programma}
   \newcommand*{\vubth@listings}{\vubth@listing 's}
   \newcommand*{\vubth@lol}{L\ij st van Programma's}}

\newlength{\vubth@lstoldstylenumsw}
\newlength{\vubth@lstlistingwidth}
\newlength{\vubth@lstleftmargin}
\newcommand*{\vubth@lstnumbersep}{10\p@}
\newcommand*{\vubth@lstsize}{\tiny}% or \scriptsize
\settowidth{\vubth@lstoldstylenumsw}{\vubth@lstsize{9999}}

\ifbool{vubth@minted}%
  {\deflength{\vubth@lstleftmargin}%
     {\vubth@lstoldstylenumsw + \vubth@lstnumbersep}

   \setminted%
     {autogobble=true,
      breakanywhere=true,
      breakanywheresymbolpre={},
      %breakanywheresymbolpre=\tiny\ensuremath{\space\hookleftarrow},
      breaklines=true,
      %escapeinside=\#\#,
      fontsize=\vubth@lstsize,
      frame=single,
      framerule=\normalrulethickness,
```

```
    %mathescape=true,% only works inside comments
    numbers=left,
    numbersep=\vubth@lstnumbersep,
    stepnumber=5,
    style=bw,
    tabsize=2,
    %texcomments=true,
    xleftmargin=\vubth@lstleftmargin}

 \setmintedinline%
   {fontsize=\footnotesize,
    frame=none,
    numbers=none}

 % The polyglossia package is doing undesirable things to code.
 % For example, adding extra space around colons in French.
 % You may need to put your code within
 % \begin{english}...\end{english}.
 \notbool{vubth@englishlang}%
   {\BeforeBeginEnvironment{minted}%
      {\begin[variant=american]{english}}
    \AfterEndEnvironment{minted}%
      {\end{english}}}%
   {}}%
{\deflength{\vubth@lstlistingwidth}{\textwidth - 4\p@}
 \deflength{\vubth@lstleftmargin}%
   {\vubth@lstnumbersep + \vubth@lstoldstylenumsw - 1.585\p@}

 % memoir font sizes (small - big):
 % miniscule - tiny - scriptsize - footnotesize - small -
 % normalsize - large - Large - LARGE - huge - Huge - HUGE
 % Ps. normalsize = classdefaultoption (10pt in vubthesis)
 \lstdefinestyle{vubthesis}%
   {basicstyle=\ttfamily\vubth@lstsize,
    prebreak=\raisebox{\z@}[\z@][\z@]{\ensuremath{\hookleftarrow}},
    postbreak=\raisebox{\z@}[\z@][\z@]%
      {\ensuremath{\hookrightarrow\space}},
    breaklines=true,
    breakatwhitespace=true,
    numbers=left,
    numberstyle=\vubth@lstsize,% \tiny\color{black}
    stepnumber=5,
    numberfirstline=true,
    %firstnumber=1,% uncomment if problems whit first number
    nolol=true,
    escapechar={},% \$
    aboveskip=\z@,
    belowskip=\z@,
    abovecaptionskip=\z@,
    belowcaptionskip=\z@,
    keywordstyle=\bfseries,% \color{javapurple}\bfseries
    commentstyle=\itshape,% \color{javagreen}
    morecomment=[s][\itshape]{/**}{*/},% \color{javablue}
    %morekeywords={traverse,giving,db,isstring,isint},
    %stringstyle=\color{javablue},
    showspaces=false,
    showstringspaces=false,
    numbersep=\vubth@lstnumbersep,
    linewidth=\vubth@lstlistingwidth,
    xleftmargin=\vubth@lstleftmargin,
    tabsize=2,
    frame=trBL,
    frameround=fttt,
    caption=\lstname,% prints the file name
    extendedchars=false,
    autogobble=true,
    %literate={:=}{{$\gets$}}1 {<=}{{$\leq$}}1
    %         {>=}{{$\geq$}}1  {<>}{{$\neq$}}1
    literate={á}{{\'{a}}}1 {é}{{\'{e}}}1 {í}{{\'{i}}}1 {ó}{{\'{o}}}1
             {ú}{{\'{u}}}1 {Á}{{\'{A}}}1 {É}{{\'{E}}}1 {Í}{{\'{I}}}1
             {Ó}{{\'{O}}}1 {Ú}{{\'{U}}}1 {à}{{\`{a}}}1 {è}{{\`{e}}}1
             {ì}{{\`{i}}}1 {ò}{{\`{o}}}1 {ù}{{\`{u}}}1 {À}{{\`{A}}}1
             {È}{{\`{E}}}1 {Ì}{{\`{I}}}1 {Ò}{{\`{O}}}1 {Ù}{{\`{U}}}1
             {ã}{{\"{a}}}1 {ẽ}{{\"{e}}}1 {ĩ}{{\"{i}}}1 {õ}{{\"{o}}}1
             {ũ}{{\"{u}}}1 {Ã}{{\"{A}}}1 {Ẽ}{{\"{E}}}1 {Ĩ}{{\"{I}}}1
             {Õ}{{\"{O}}}1 {Ũ}{{\"{U}}}1 {â}{{\^{a}}}1 {ê}{{\^{e}}}1
             {î}{{\^{i}}}1 {ô}{{\^{o}}}1 {û}{{\^{u}}}1 {Â}{{\^{A}}}1
             {Ê}{{\^{E}}}1 {Î}{{\^{I}}}1 {Ô}{{\^{O}}}1 {Û}{{\^{U}}}1
             {œ}{{\oe}}1   {Œ}{{\OE}}1   {æ}{{\ae}}1   {Æ}{{\AE}}1
```

```
              {ß}{{\ss}}1   {ç}{{\c{c}}}1 {Ç}{{\c{C}}}1 {ø}{{\o}}1
              {å}{{\r{a}}}1 {Å}{{\r{A}}}1 {€}{{\EUR}}1  {£}{{\pounds}}1}

   \lstloadlanguages{Java,Prolog,SPARQL,SQL,XML,HTML,Perl,[LaTeX]TeX,R}
   \lstset{style=vubthesis}}

\ifbool{vubth@standardfonts}%
  {\ClassWarningNoLine{vubthesis}%
     {The standard monotype font `\vubth@monofont'\MessageBreak%
      does not contain a bold series.\MessageBreak%
      This conflicts with
      \ifbool{vubth@minted}%
        {minted style option `bw'.}%
        {the keywordstyle of listings.}%
      \MessageBreak%
      As a result, some characters will not be
      displayed correctly.\MessageBreak%
      Either select a different
      \ifbool{vubth@minted}%
        {minted style using `\string\setminted',}%
        {listings keywordstyle using `\string\lstset',}%
      \MessageBreak%
      or change the monotype font using
      `\string\setmonofont'\MessageBreak%
      after loading this class}}%
  {}

% Fancyvrb number formatting
% Currently only used by `minted', but also possible
% to be used by `listings' fancyvrb interface.
% Default: \rmfamily\tiny\arabic{FancyVerbLine}
\renewcommand*{\theFancyVerbLine}%
  {\rmfamily\tiny\arabic{FancyVerbLine}}

% Note that when math is used inside escapes,
% in a few cases ligature handling may need to be modified.
% The single-quote character (') is normally a shortcut
% for ^\prime in math mode, but this is disabled in verbatim content
% as a byproduct of ligatures being disabled.
% For the same reason, any package that relies on active characters
% in math mode (for example, icomma) will produce errors
% along the lines of TeX capacity exceeded and \leavevmode\kern\z@.
% This may be fixed by modifying \@noligs, as described at
% http://tex.stackexchange.com/questions/223876.
% minted currently does not attempt to patch \@noligs due
% to the potential for package conflicts.
\apptocmd{\do@noligs}%
  {\begingroup\lccode`\~=`\'
   \lowercase{\endgroup\def~}{%
     \ifmmode
       \expandafter\active@math@prime
     \else
       \leavevmode\kern\z@\char`\'
     \fi}}%
  {}%
  {\ClassWarning{vubthesis}%
     {Could not patch `\string\do@noligs'}}

% LISTOF LISTINGS
\newlistof{listoflistings}%
  {lol}%
  {\vubth@lol}

% Float
% Named `ftlisting' in order not to clash with
% the naming of `listing' provided by `minted'.
\newfloat[chapter]{ftlisting}%
  {lol}%
  {\xmakefirstuc{\vubth@listing}}
\newsubfloat{ftlisting}

\ifbool{draftdoc}%
  {\NagDeclareFloat{ftlisting}}%
  {}

% Appearance
\defcounter{loldepth}{2}
\setfloatlocations{ftlisting}%
  {htbp}
```

```
\newlistentry[chapter]{ftlisting}%
  {lol}%
  {\z@}
\cftsetindents{ftlisting}%
  {\z@}%
  {3em}% Original 2.3em
\cftsetindents{subftlisting}%
  {3em}%
  {3.9em}
% `\listingcaption' can be used in- and outside
% of the `ftlisting' environment.
% Here we cannot use the trick we used with definitions
% since minted does not define a counter for its environment
% and we need actual captioning. Luckily memoir provides
% a build-in command that allows captioning inside and
% outside of a float, namely `fixedcaption'. Thus whether or
% not we place this command in a `ftlisting' or just use it
% in text without the presence of a float, the naming will
% be consistent with the `ftlisting' float.
\newfixedcaption%
  {\listingcaption}%
  {ftlisting}

\addtocontents{lol}{\hspace*{\fill}\textbf{\pagename}\par}
\addtodef*{\insertchapterspace}%
  {}%
  {\addtocontents{lol}{\protect\addvspace{10\p@}}}

\addtodef{\@memfront@floats}%
  {}%
  {\counterwithout{ftlisting}{chapter}}
\addtodef{\@memmain@floats}%
  {}%
  {\counterwithin{ftlisting}{chapter}}
\addtodef{\@memback@floats}%
  {}%
  {\counterwithout{ftlisting}{chapter}
   \defcounter{ftlisting}{\z@}}

\addtopsmarks{vubthesis}%
  {}%
  {\createplainmark{lol}%
     {both}%
     {\vubth@lol}}

%\AtEndDocument{\addtocontents{lol}{\par}}

% Caption
%\renewenvironment{ftlisting}%
%  {\deflength{\abovecaptionskip}{1.25\onelineskip}
%   \deflength{\belowcaptionskip}{\z@}
%   \@float{ftlisting}}%
%  {\end@float}
%\renewenvironment{ftlisting*}%
%  {\deflength{\abovecaptionskip}{1.25\onelineskip}
%   \deflength{\belowcaptionskip}{\z@}
%   \@dblfloat{ftlisting}}%
%  {\end@dblfloat}
\hypcapredef{ftlisting}
\hypcapredef{ftlisting*}
\setfloatadjustment{ftlisting}%
  {\deflength{\abovecaptionskip}{\z@}
   \deflength{\belowcaptionskip}{\onelineskip}}

% Cleveref setup
\ifbool{vubth@capitalizecref}%
  {\crefname{ftlisting}%
     {\xmakefirstuc{\vubth@listing}}%
     {\emakefirstuc{\vubth@listings}}}%
  {\crefname{ftlisting}%
     {\vubth@listing}%
     {\vubth@listings}}
\Crefname{ftlisting}%
  {\xmakefirstuc{\vubth@listing}}%
  {\emakefirstuc{\vubth@listings}}

%-------------------------------------------------------------------------
% URL STYLE
```

```
\urlstyle{same}% rm (default)

%-------------------------------------------------------------------------
% BIBLIOGRAPHY

\newcommand*{\vubth@bibheading}{\bibname}

\newcommand*{\vubth@fmtbiblabel}%
  {\brackettext%
     {\thefield{prefixnumber}%
      \thefield{labelalpha}%
      \thefield{extraalpha}}}

\AtEveryBibitem%
  {% Test if \parnopar has an effect
   %\parnopar
   \markboth%
     {\vubth@fmtbiblabel}%
     {\vubth@fmtbiblabel}}

\newcommand*{\vubth@dictionarymark}%
  {\ifdefequal{\leftmark}{\rightmark}%
     {\rightmark}%
     {\rightmark\space -- \leftmark}}

\ifbool{vubth@bibdictmarks}%
  {\let\vubth@bibheading\vubth@dictionarymark}%
  {}

\copypagestyle{vubthesisbibliography}{vubthesis}
\ifbool{vubth@headersecatedge}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisbibliography}%
        {\vubth@headfootstyle{\vubth@bibheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisbibliography}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@bibheading}}}%
     {\makeevenhead{vubthesisbibliography}%
        {\vubth@headfootstyle{\vubth@bibheading}}%
        {}%
        {}
      \makeoddhead{vubthesisbibliography}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@bibheading}}}}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisbibliography}%
        {\vubth@headfootstyle{\vubth@bibheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisbibliography}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@bibheading}}}%
     {\makeevenhead{vubthesisbibliography}%
        {\vubth@headfootstyle{\vubth@bibheading}}%
        {}%
        {}
      \makeoddhead{vubthesisbibliography}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@bibheading}}}}

\addbibresource{vubthesis.bib}

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@nociteall}}%
  {\nocite{*}}%
  {}

%-------------------------------------------------------------------------
% BIBLATEX

\defcounter{biburlnumpenalty}{9000}
```

```
\defcounter{biburlucpenalty}{9000}
\defcounter{biburllcpenalty}{9000}

\ifbool{draftdoc}%
  {\newcommand*{\displayemergencystretch}%
     {Emergency stretch: \the\emergencystretch}
   \newcommand*{\displaytolerance}%
     {Tolerance: \number\tolerance}

   % Check whether the emergencystretch
   % has been set for a particular bibentry
   % Alternative Definition:
   % \finentry + \addspace +
   % \printtext[parens]{\displayemergencystretch}
   \renewbibmacro*{finentry}%
     {\newunit
      \newblock
      \printtext[parens]%
        {\printtext{\displayemergencystretch}%
         \newunit
         \printtext{\displaytolerance}}
      \finentry}}%
  {}

\ifbool{vubth@urldatetoday}%
  {\DeclareSourcemap%
     {\maps%
        {\map[overwrite=true]%
           {\pertype{online}
            \step[fieldset=urldate,
                  fieldvalue={\the\year-%
                              \two@digits{\the\month}-%
                              \two@digits{\the\day}}]}}}}%
  {}

%-----------------------------------------------------------------------
% DATETIME2

\newcommand*{\DTMdutchshortmonthname}[1]%
  {\ifcase#1%
     \or jan%
     \or feb%
     \or maa%
     \or apr%
     \or mei%
     \or jun%
     \or jul%
     \or aug%
     \or sep%
     \or okt%
     \or nov%
     \or dec%
   \fi}

\newcommand*{\DTMdutchshortMonthname}[1]%
  {\ifcase#1%
     \or Jan%
     \or Feb%
     \or Maa%
     \or Apr%
     \or Mei%
     \or Jun%
     \or Jul%
     \or Aug%
     \or Sep%
     \or Okt%
     \or Nov%
     \or Dec%
   \fi}

\DTMdefboolkey%
  {dutch}%
  {abbr}%
  [true]%
  {}
\DTMsetbool%
  {dutch}%
  {abbr}%
  {false}
```

```
\DTMdefboolkey%
  {english}%
  {abbr}%
  [true]%
  {}
\DTMsetbool%
  {english}%
  {abbr}%
  {false}
\DTMdefboolkey%
  {english}%
  {showdayofmonth}%
  [true]%
  {}
\DTMsetbool%
  {english}%
  {showdayofmonth}%
  {true}
\DTMdefboolkey%
  {english}%
  {showyear}%
  [true]%
  {}
\DTMsetbool%
  {english}%
  {showyear}%
  {true}

\DTMnewstyle%
  {vubthdutch}% label
  % date style
  {\renewcommand*{\DTMdisplaydate}[4]%
     {\ifbool{DTMshowdow}%
        {\ifnumgreater{##4}{-1}%
           {\DTMifbool{dutch}{abbr}%
              {\DTMdutchshortweekdayname{##4}}%
              {\DTMdutchweekdayname{##4}}%
            \space}%
           {}}%
        {}%
      \DTMifbool{dutch}{showdayofmonth}%
        {\DTMdutchordinal{##3}%
         \DTMdutchdaymonthsep}%
        {}%
      \DTMifbool{dutch}{abbr}%
        {\DTMdutchshortmonthname{##2}}%
        {\DTMdutchmonthname{##2}}%
      \DTMifbool{dutch}{showyear}%
        {\DTMdutchmonthyearsep%
         \number ##1 }% space intended
        {}}
   \renewcommand*{\DTMDisplaydate}[4]%
     {\ifbool{DTMshowdow}%
        {\ifnumgreater{##4}{-1}%
           {\DTMifbool{dutch}{abbr}%
              {\DTMdutchshortWeekdayname{##4}}%
              {\DTMdutchWeekdayname{##4}}%
            \space}%
           {}}%
        {}%
      \DTMifbool{dutch}{showdayofmonth}%
        {\DTMdutchordinal{##3}%
         \DTMdutchdaymonthsep}%
        {}%
      \ifbool{DTMshowdow}%
        {\DTMifbool{dutch}{abbr}%
           {\DTMdutchshortmonthname{##2}}%
           {\DTMdutchmonthname{##2}}}%
        {\DTMifbool{dutch}{showdayofmonth}
           {\DTMifbool{dutch}{abbr}%
              {\DTMdutchshortmonthname{##2}}%
              {\DTMdutchmonthname{##2}}%}%
           {\DTMifbool{dutch}{abbr}%
              {\DTMdutchshortMonthname{##2}}%
              {\DTMdutchMonthname{##2}}}}%
      \DTMifbool{dutch}{showyear}%
        {\DTMdutchmonthyearsep
         \number ##1 }% space intended
        {}}}%
```

```
  % time style
  {\DTMsettimestyle{hmmss}}%
  % zone style
  {\DTMresetzones
   \DTMdutchzonemaps
   \renewcommand*{\DTMdisplayzone}[2]%
     {\DTMifbool{dutch}{mapzone}%
        {\DTMusezonemapordefault{##1}{##2}}%
        {\ifnumless{##1}{0}%
           {}%
           {+}%
         \DTMtwodigits{##1}%
         \ifbool{DTMshowzoneminutes}%
           {\DTMdutchtimesep%
            \DTMtwodigits{##2}}%
           {}}}}%
  % full style
  {\renewcommand*{\DTMdisplay}[9]%
     {\ifbool{DTMshowdate}%
        {\DTMdisplaydate{##1}{##2}{##3}{##4}%
         \DTMdutchdatetimesep}%
        {}%
      \DTMdisplaytime{##5}{##6}{##7}%
      \ifbool{DTMshowzone}%
        {\DTMdutchtimezonesep%
         \DTMdisplayzone{##8}{##9}}%
        {}}%
   \renewcommand*{\DTMDisplay}[9]%
     {\ifbool{DTMshowdate}%
        {\DTMDisplaydate{##1}{##2}{##3}{##4}%
         \DTMdutchdatetimesep}%
        {}%
      \DTMdisplaytime{##5}{##6}{##7}%
      \ifbool{DTMshowzone}%
        {\DTMdutchtimezonesep%
         \DTMdisplayzone{##8}{##9}}%
        {}}}

\DTMnewstyle%
  {vubthamerican}% label
  % date style
  {\renewcommand*{\DTMdisplaydate}[4]%
     {\ifbool{DTMshowdow}%
        {\ifnumgreater{##4}{-1}%
           {\DTMifbool{english}{abbr}%
              {\DTMenglishshortweekdayname{##4}}%
              {\DTMenglishweekdayname{##4}}%
            ,\space}%
           {}}%
        {}%
      \DTMifbool{english}{abbr}%
        {\DTMenglishshortmonthname{##2}}%
        {\DTMenglishmonthname{##2}}%
      \DTMifbool{english}{showdayofmonth}%
        {\space
         \DTMenglishordinal{##3}}%
        {}%
      \DTMifbool{english}{showyear}%
        {,\space%
         \number ##1 }% space intended
        {}}
   \renewcommand*{\DTMDisplaydate}[4]%
     {\DTMdisplaydate%
        {##1}%
        {##2}%
        {##3}%
        {##4}}}%
  % time style
  {\renewcommand*{\DTMenglisham}%
     {\space am}%
   \renewcommand*{\DTMenglishpm}%
     {\space pm}%
   \renewcommand*{\DTMenglishtimesep}%
     {\DTMenUStimesep}%
   \DTMsettimestyle{englishampm}}%
  % zone style
  {\DTMsetzonestyle{default}}%
  % full style
  {\renewcommand*{\DTMdisplay}[9]%
```

```
      {\ifbool{DTMshowdate}%
         {\DTMdisplaydate{##1}{##2}{##3}{##4}%
          \space}%
         {}%
       \DTMdisplaytime{##5}{##6}{##7}%
       \ifbool{DTMshowzone}%
         {\space
          \DTMdisplayzone{##8}{##9}}%
         {}}%
    \renewcommand*{\DTMDisplay}%
      {\DTMdisplay}}

% Polyglossia sets the default language \AtBeginDocument
% which causes the dates to be redefined, i.e. they use
% a language specific date. In order to override this
% behavior and provide a default style based upon the
% thesis language, we use the hook \AfterEndPreamble
% which is executed after all \AtBeginDocument hooks.
% Ps. We set a default vubthesis `datetime2' style.
% Otherwise the default would be the last language module
% loaded, i.e.
% the last option passed on to the `datetime2' package.
\AfterEndPreamble%
  {\ifbool{vubth@englishlang}%
     {\DTMsetstyle{vubthamerican}}%
     {\DTMsetstyle{vubthdutch}}}

%-------------------------------------------------------------------------
% CITECOMMANDS

\DeclareCiteCommand{\citefirstlastname}%
  {\boolfalse{citetracker}%
   \boolfalse{pagetracker}%
   \DeclareNameAlias{labelname}{first-last}%
   \usebibmacro{prenote}}%
  {\ifciteindex%
     {\indexnames{labelname}}%
     {}%
   {\printtext[bibhyperref]{\printnames{labelname}}}}%
  {\multicitedelim}%
  {\usebibmacro{postnote}}

\DeclareCiteCommand{\citelastfirstname}%
  {\boolfalse{citetracker}%
   \boolfalse{pagetracker}%
   \DeclareNameAlias{labelname}{last-first}%
   \usebibmacro{prenote}}%
  {\ifciteindex%
     {\indexnames{labelname}}%
     {}%
   {\printtext[bibhyperref]{\printnames{labelname}}}}%
  {\multicitedelim}%
  {\usebibmacro{postnote}}

\DeclareCiteCommand{\citefullname}%
  {\defcounter{uniquename}{2}%
   \boolfalse{citetracker}%
   \boolfalse{pagetracker}%
   \usebibmacro{prenote}}%
  {\ifciteindex%
     {\indexnames{labelname}}%
     {}%
   {\printtext[bibhyperref]{\printnames{labelname}}}}%
  {\multicitedelim}%
  {\usebibmacro{postnote}}

%-------------------------------------------------------------------------
% CSQUOTES

% SetCiteCommand to \parencite for explicit parencite,
% cite & parencite are the same at ieee
\SetCiteCommand{\autocite}
%\renewcommand{\mkccitation}[1]{\space#1}% default definition

\renewcommand{\mkbegdispquote}[2]%
  {\openautoquote}
\renewcommand{\mkenddispquote}[2]%
  {\closeautoquote#1#2}
```

```
%-----------------------------------------------------------------------
% CENSOR & CHANGEMARKS

\ifbool{draftdoc}%
  {\changemarks}%
  {\StopCensoring}

\ifbool{vubth@isochangemarks}%
  {\renewcommand{\v@rid}[2]%
     {\ifboolexpr%
        {bool {draftdoc}
         and
         bool {changemarks}}%
        {\marginpar[#1]{#2}}%
        {}}

    \newcommand*{\editorial}[1]%
      {\@bsphack
       \ifbool{changemarks}%
         {\v@rid%
            {\small\hfill$^{#1}$ED}%
            {\small ED$^{#1}$\hfill}}%
         {}
       \@esphack}

    \renewcommand{\changed}[1]%
      {\editorial{#1}}

    \renewcommand{\added}[2]%
      {\@bsphack
       \ifbool{changemarks}%
         {\v@rid%
            {\small\hfill$^{#2}\Rightarrow$}%
            {\small $\Leftarrow^{#2}$\hfill}%
          \emph{#1}}%
         {#1}
       \@esphack}

    \renewcommand{\deleted}[1]%
      {\@bsphack
       \ifbool{changemarks}%
         {\v@rid%
            {\small\hfill$^{#1}\Leftarrow$}%
            {\small $\Rightarrow^{#1}$\hfill}}%
         {}
       \@esphack}

    \newcommand*{\moved}[2]%
      {\@bsphack
       \ifbool{changemarks}%
         {\v@rid%
            {\small\hfill$^{#2}\Leftrightarrow$}%
            {\small $\Leftrightarrow^{#2}$\hfill}%
          \emph{#1}}%
         {#1}
       \@esphack}}%
  {\newcommand{\editorial}[1]%
     {\changed{#1}}

   \let\memoiradded\added% ok
   \renewcommand{\added}[2]%
     {\memoiradded{#2}}

   % Here we allow \par as an argument,
   % since \changed allows this as well
   \newcommand{\moved}[2]%
     {\changed{#2}}}

%-----------------------------------------------------------------------
% TODONOTES, PDFCOMMENT & BLINDTEXT

\ifbool{draftdoc}%
  {\ifbool{vubth@englishlang}%
     {\@todonotes@SetTodoListName{List of Todos}
      \@todonotes@SetMissingFigureText{Figure}
      \@todonotes@SetMissingFigureUp{Missing}
      \@todonotes@SetMissingFigureDown{figure}
      \renewcommand{\lpcname}{List of PDF Comments}}%
     {\@todonotes@SetTodoListName{L\ij st van onafgewerkte taken}
```

```
      \@todonotes@SetMissingFigureText{Figuur}
      \@todonotes@SetMissingFigureUp{Ontbrekende}
      \@todonotes@SetMissingFigureDown{figuur}
      \renewcommand{\lpcname}{L\ij st van PDF opmerkingen}}}%
  {\newcommand{\todo}[2][]%
     {\@bsphack\@esphack}
   \newcommand{\missingfigure}[2][]%
     {\@bsphack\@esphack}
   \newcommand{\listoftodos}[1][]%
     {}
   \newcommand{\blindtext}[1][]%
     {\@bsphack\@esphack}
   \newcommand{\Blindtext}[1][]%
     {\@bsphack\@esphack}}

% PDFCOMMENT
% User commands
%\pdfmargincomment (date,deadline,subject,icon,id=pc:...)
%\pdftooltip
\pdfcommentsetup%
  {timezone=+01'00'}

\defineavatar{ma}% stands for main author
  {author=\@author,
   color=orange}

%-------------------------------------------------------------------------
% COMMENT

\newcomment{review}
\notbool{draftdoc}%
  {\commentsoff{review}}%
  {}

%-------------------------------------------------------------------------
% POEM

%\renewcommand{\poemtoc}%
%  {chapter}

\renewcommand{\poemtitlemark}[1]%
  {\markboth{#1}{}}% original: \markboth{#1}{#1}

\newcommand*{\attrib}[1]%
  {\nopagebreak%
     {\raggedleft
      \footnotesize
      #1
      \par}}

\PlainPoemTitle

%-------------------------------------------------------------------------
% GLOSSARY

% Failsafe translation if the package
% `glossaries-dutch' is unavailable.
\notbool{vubth@englishlang}%
  {\IfFileExists{glossaries-dutch.ldf}%
     {}%
     {\renewcommand*{\acronymname}%
        {Acroniemen}}}%
  {}

% Solution to a question asked on:
% http://tex.stackexchange.com/questions/220395/
% why-does-hyperref-complain-about-token-not-allowed-in-a-pdf
% -string-in-my-gloss
% Why does hyperref complain about
% ``token not allowed in a PDF string''
% in my glossary when I've set the default language?
% We implement a solution proposed by Nicola Talbot,
% i.e. the package author.
\pdfstringdefDisableCommands%
  {\ifbool{vubth@englishlang}%
     {\let\textenglish\@firstofone}%
     {\let\textdutch\@firstofone}}

\newcommand*{\vubth@acroheading}{\acronymname}
```

```
\ifbool{vubth@acrodictmarks}%
  {\let\vubth@acroheading\vubth@dictionarymark}%
  {}

%\newcommand*{\vubth@glsentry}{}
\forallglsentries{\vubth@glsentry}%
  {\markboth%
     {\vubth@glsentry}%
     {\vubth@glsentry}}

\newcommand*{\doglobookmark}[1]%
  {\ifstrequal{#1}{Symbols}%
     {\phantomsection%
      \pdfbookmark[0]{Analphabetics}{Analphabetics-glo}}%
     {\phantomsection%
      \pdfbookmark[0]{#1}{#1-glo}}}

\setacronymstyle{long-sc-short}% or `long-sc-short-desc'

\copypagestyle{vubthesisacronym}{vubthesis}
\ifbool{vubth@headersecatedge}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisacronym}%
        {\vubth@headfootstyle{\vubth@acroheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisacronym}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@acroheading}}}%
     {\makeevenhead{vubthesisacronym}%
        {\vubth@headfootstyle{\vubth@acroheading}}%
        {}%
        {}
      \makeoddhead{vubthesisacronym}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@acroheading}}}}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisacronym}%
        {\vubth@headfootstyle{\vubth@acroheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisacronym}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@acroheading}}}%
     {\makeevenhead{vubthesisacronym}%
        {\vubth@headfootstyle{\vubth@acroheading}}%
        {}%
        {}
      \makeoddhead{vubthesisacronym}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@acroheading}}}}

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@acronymall}}%
  {% just to be sure we use \AfterEndPreamble instead of
   % \AtBeginDocument to be certain that the latter hook
   % is executed first.
   \AfterEndPreamble%
     {\xpretocmd{\printacronyms}%
        {\glsaddallunused}%
        {}%
        {\ClassWarning{vubthesis}%
           {Could not patch `\string\printacronyms'}}}%
     %\LetLtxMacro{\glsprintacronyms}{\printacronyms}
     % printacronyms reads in the optional parameter
     % just to be safe. We could also not read in the
     % parameters and let the glossaries package take
     % care of them.
     %\renewcommand*{\printacronyms}[1][]%
     %  {\glsaddallunused\glsprintacronyms[#1]}}%
  {}
```

```
\makeglossaries

%---------------------------------------------------------------------------
% INDEX

% Define main indexentry
\newcommand*{\mainie}%
  {\emph}

\newcommand*{\vubth@idxheading}{\indexname}

\ifbool{vubth@idxdictmarks}%
  {\let\vubth@idxheading\vubth@dictionarymark}%
  {}

% Idxcmds Setup
\setidxcmds%
  {sort-sep=@,% `actual' in makeindex
   sub-sep=!,% `level' in makeindex
   idx-cmd=\index}% idx-cmd \index is default

% Idxcmds Commands
\newidxcmd{\person}{#1}
\newidxcmd{\acro}{\textsc{#1}}

\newcommand*{\idxmark}[1]%
  {#1\markboth{#1}{#1}}

\newcommand*{\doidxbookmark}[1]%
  {\begingroup
     \centering
     \bfseries
     \ifstrequal{#1}{Symbols}%
       {Analphabetics%
        \phantomsection%
        \pdfbookmark[1]{Analphabetics}{Analphabetics-idx}}%
        %\label{AnalphabeticsAnalphabeticsAnalphabetics-idx}%
       {#1%
        \phantomsection%
        \pdfbookmark[1]{#1}{#1-idx}}
        %\label{#1#1#1-idx}%
     \vspace{\onelineskip}
     \par
   \endgroup}

\copypagestyle{vubthesisindex}{vubthesis}
\ifbool{vubth@headersecatedge}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisindex}%
        {\vubth@headfootstyle{\vubth@idxheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisindex}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@idxheading}}}%
     {\makeevenhead{vubthesisindex}%
        {\vubth@headfootstyle{\vubth@idxheading}}%
        {}%
        {}
      \makeoddhead{vubthesisindex}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@idxheading}}}}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesisindex}%
        {\vubth@headfootstyle{\vubth@idxheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesisindex}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@idxheading}}}%
     {\makeevenhead{vubthesisindex}%
        {\vubth@headfootstyle{\vubth@idxheading}}%
        {}%
        {}
      \makeoddhead{vubthesisindex}%
        {}%
```

```
        {}%
        {\vubth@headfootstyle{\vubth@idxheading}}}}

%%\aliaspagestyle{indextitlepagestyle}{vubthesisindex}

\ifboolexpr%
  {bool {draftdoc}
   and
   bool {vubth@indexmarks}}%
  % default definition of \indexmarkstyle:
  % \indexmarkstyle{\normalfont\footnotesize\ttfamily}
  % change in draftdoc mode if required
  {\showindexmarks}%
  {}

\makeindex

%-------------------------------------------------------------------------
% PAGENOTES & FOOTNOTES

\notbool{vubth@englishlang}%
  {\renewcommand*{\notesname}%
     {Nota's}
   \renewcommand*{\pagerefname}%
     {Pagina}}%
  {}

% In the standard classes, footnotes on a page that has a float
% at the bottom are typeset before the float. Following the
% \feetbelowfloat declaration footnotes will be typeset at
% the bottom of the page below any bottom floats; they will also
% be typeset at the bottom of \raggedbottom pages as opposed to
% being put just after the bottom line of text.
% The standard positioning is used following the \feetabovefloat
% declaration, which is the default.
\feetbelowfloat

% Paragraphed footnotes may overflow the bottom of a page.
% TeX has to estimate the amount of space that the paragraph
% will require once all the footnotes are assembled into it.
% It then chops off the main text to leave the requisite space
% at the bottom of the page, following which it assembles and
% typesets the paragraph. If it underestimated the size then
% the footnotes will run down the page too far. If this happens
% then you can change \footfudgefiddle to make TeX be more generous
% in its estimation. The default is 64 and a value about 10% higher
% should fix most overruns.
%\renewcommand*{\footfudgefiddle}{70}

\newcommand*{\vubth@pgnheading}{\notesname}

\ifbool{vubth@pgndictmarks}%
  {\let\vubth@pgnheading\vubth@dictionarymark}%
  {}

\ifbool{vubth@pagenotes}%
  {\makepagenote
   \notepageref
   %\renewcommand*{\notedivision}%
   %  {\chapter*{\notesname}}
   \renewcommand{\pagenotesubheadstarred}[3]%
     {\section*{#3}}}%
  {}

\copypagestyle{vubthesispagenotes}{vubthesis}
\ifbool{vubth@headersecatedge}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesispagenotes}%
        {\vubth@headfootstyle{\vubth@pgnheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesispagenotes}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@pgnheading}}}%
     {\makeevenhead{vubthesispagenotes}%
        {\vubth@headfootstyle{\vubth@pgnheading}}%
        {}%
        {}
```

```
      \makeoddhead{vubthesispagenotes}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@pgnheading}}}%
  {\ifbool{draftdoc}%
     {\makeevenhead{vubthesispagenotes}%
        {\vubth@headfootstyle{\vubth@pgnheading}}%
        {}%
        {\vubth@headerdraftmark}
      \makeoddhead{vubthesispagenotes}%
        {\vubth@headerdraftmark}%
        {}%
        {\vubth@headfootstyle{\vubth@pgnheading}}%
     {\makeevenhead{vubthesispagenotes}%
        {\vubth@headfootstyle{\vubth@pgnheading}}%
        {}%
        {}
      \makeoddhead{vubthesispagenotes}%
        {}%
        {}%
        {\vubth@headfootstyle{\vubth@pgnheading}}}}

% Footnotemarks ordering according to Robert Bringhurst
\renewcommand*{\@fnsymbol}[1]%
  {\ifcase#1%
     \or
       \TextOrMath{\textasteriskcentered}%
         {*}%
     \or
       \TextOrMath{\textdagger}%
         {\dagger}%
     \or
       \TextOrMath{\textdaggerdbl}%
         {\ddagger}%
     \or
       \TextOrMath{\textsection}%
         {\mathsection}%
     \or
       \TextOrMath{\textbardbl}%
         {\|}%
     \or
       \TextOrMath{\textparagraph}%
         {\mathparagraph}%
     \or
       \TextOrMath{\textasteriskcentered\textasteriskcentered}%
         {**}%
     \or
       \TextOrMath{\textdagger\textdagger}%
         {\dagger\dagger}%
     \or
       \TextOrMath{\textdaggerdbl\textdaggerdbl}%
         {\ddagger\ddagger}%
     \else
       \@ctrerr%
   \fi}

% To get the footnote reference marks set with symbols use:
%\renewcommand*{\thefootnote}%
%  {\fnsymbol{footnote}}

% Footnotemarks at baseline in parentheses
%\renewcommand*{\@makefnmark}%
%  {\slashfracstyle{(\@thefnmark)}}
%\footmarkstyle{\slashfracstyle{(#1)}\space}

% Pagenotes at the baseline in parentheses
% Referencemark
%\renewcommand{\notenumintext}[1]%
%  {\slashfracstyle{(#1)}}
% In list of pagenotes
%\renewcommand{\notenuminnotes}[1]%
%  {{\normalfont (#1)}\space}

%-------------------------------------------------------------------------
% LISTOF HEADER & INDENT

% Need more space for ToC page numbers.
\setpnumwidth{2.55em}
\setrmarg{3.55em}
```

```
%\renewcommand{\cftdotsep}{1.5}
%\renewcommand{\@dotsep}{1.5}

% Allow subfloats for figure & table
\newsubfloat{figure}
\defcounter{lofdepth}{2}% show subfigure in ToC
\newsubfloat{table}
\defcounter{lotdepth}{2}% show subtable in ToC

% Need more space for ToC section numbers.
\cftsetindents{chapter}%
  {0em}%
  {2.3em}
\cftsetindents{section}%
  {2.3em}%
  {3em}
\cftsetindents{subsection}%
  {5.3em}%
  {3.8em}
\cftsetindents{subsubsection}%
  {9.1em}%
  {4.6em}
\cftsetindents{paragraph}%
  {13.7em}%
  {5.3em}
\cftsetindents{subparagraph}%
  {19em}%
  {6.1em}

% And for LoF and LoT numbers.
\cftsetindents{figure}%
  {\z@}%
  {3em}% Original 2.3em
\cftsetindents{subfigure}%
  {3em}%
  {3.9em}
\cftsetindents{table}%
  {\z@}%
  {3em}% Original 2.3em
\cftsetindents{subtable}%
  {3em}%
  {3.9em}

\addtocontents{toc}%
  {\hspace*{\fill}\textbf{\pagename}\par}
\addtocontents{toc}%
  {\vspace{10\p@}}%of \tocskip{10\p@}
\addtocontents{lot}%
  {\hspace*{\fill}\textbf{\pagename}\par}
\addtocontents{lof}%
  {\hspace*{\fill}\textbf{\pagename}\par}

\ifbool{draftdoc}%
  {\addtocontents{tdo}%
     {\hspace*{\fill}\textbf{\pagename}\par}
   \addtocontents{lpc}%
     {\hspace*{\fill}\textbf{\pagename}\par}}%
  {}

%\AtEndDocument{\addtocontents{toc}{\par}}
%\AtEndDocument{\addtocontents{lot}{\par}}
%\AtEndDocument{\addtocontents{lof}{\par}}
%\AtEndDocument{\addtocontents{tdo}{\par}}
%\AtEndDocument{\addtocontents{lpc}{\par}}
%\AtEndDocument{\addtocontents{ent}{\par}}

%-------------------------------------------------------------------------
% QRCODE

\qrset%
  {height=2cm,% default is 2cm, first set to 4cm
   level=H}

%-------------------------------------------------------------------------
% ATTACHFILE & PDFCOMMENT

\attachfilesetup%
  {appearance=false,
   author=\@author,
```

```
    color=black,
    %description=set on entry basis,
    icon=Paperclip,
    %mimetype=text/plain,% set on entry basis
    print=true,
    %subject=set on entry basis (file name),
    timezone=+01'00'}

%-----------------------------------------------------------------------
% VARIOUS MEMOIR SNIPLETS

% Remove Page number if the document contains only one page
\AtEndDocument%
  {\ifnumequal{\value{lastsheet}}{1}%
     {\thispagestyle{empty}}%
     {}}

% A Kind Of Draft Note
% A new command that allows you to note down ideas or annotations
% in the margin of the draft. If you are printing on a stock that
% is wider than the final page width, we will go to some length
% to utilize the paper that would otherwise be trimmed away,
% assuming you will not be trimming the draft. These notes will
% not be printed when we are not in draft mode.
\ifbool{draftdoc}%
  {\newlength{\vubth@draftnotewidth}
   \newlength{\vubth@draftnotesignwidth}
   \newcommand{\draftnote}[1]%
     {\@bsphack
      % do not interfere with settings for other marginal notes
      \begingroup
        \strictpagecheck
        \checkoddpage
        \deflength{\vubth@draftnotewidth}%
          {\foremargin + \trimedge - 3\marginparsep}%
        \ifbool{oddpage}%
          {\deflength{\marginparwidth}%
             {\vubth@draftnotewidth}
           \marginpar%
             {\raggedright
              \textbf{\textit{\HUGE\ !}}
              \small
              #1}}%
          {\settowidth{\vubth@draftnotesignwidth}%
             {\textbf{\textit{\HUGE\ !}}}%
           \deflength{\vubth@draftnotewidth}%
             {\vubth@draftnotewidth - \vubth@draftnotesignwidth}%
           \marginpar%
             {\raggedleft
              \makebox[\z@][r]%
                {%% hack around
                 \parbox[t]%
                   {\vubth@draftnotewidth}%
                   {%%%%%%%%% funny behaviour
                    \raggedleft
                    \small
                    \hspace{\z@}%
                    #1}}
              \textbf{\textit{\HUGE\ !}}}}
      \endgroup
      \@esphack}}%
  {\newcommand{\draftnote}[1]{\@bsphack\@esphack}}

% Adding Indentation to Footnotes
%\newlength{\vubth@extrafootnoteindent}
%\deflength{\vubth@extrafootnoteindent}{\parindent}
%\renewcommand{\makefootmarkhook}%
%  {\deflength{\leftskip}{\leftskip + \vubth@extrafootnoteindent}}

% Chapter & Appendix Toc
\LetLtxMacro{\normalchangetocdepth}{\changetocdepth}% ok robust cmd

% Chapter Toc
\ifbool{vubth@chaptertoc}%
  {\newcounter{vubth@tocmarker}
   \newcounter{vubth@chaptocdepth}
   \renewcommand{\mempreaddchaptertotochook}%
     {\cftinserthook{toc}{end-\thevubth@tocmarker}}
   \renewcommand{\mempreaddparttotochook}%
```

```
    {\cftinserthook{toc}{end-\thevubth@tocmarker}}
  \renewcommand{\mempreaddbooktotochook}%
    {\cftinserthook{toc}{end-\thevubth@tocmarker}}
  \renewcommand{\mempreaddapppagetotochook}%
    {\cftinserthook{toc}{end-\thevubth@tocmarker}}

  % Chapter Toc: start marker
  \renewcommand{\mempostaddchaptertotochook}%
    {\stepcounter{vubth@tocmarker}
     \cftinserthook{toc}{start-\thevubth@tocmarker}}

  \newcommand*{\chaptertoc}%
    {% make changes local, remember that counters store their
     % current value globally, which is restored later
     % remember that defcounter is local by default
     \defcounter{vubth@chaptocdepth}{\value{tocdepth}}
     \begingroup
       % when ever \settocdepth is used, it adds the new value
       % to the ToC data. This cause problems when we want to
       % disable all entries. Luckily the data is added via a
       % special macro, which we redefine. Remember that we
       % stored the original value earlier.
       \let\changetocdepth\@gobble% ok
       % disable all entries (using our copy from above)
       \normalchangetocdepth{\toclevel@none}
       % enable toc data within our block,
       % we go as far as subsubsection
       \cftinsertcode{start-\thevubth@tocmarker}%
         {\normalchangetocdepth{\value{vubth@chaptocdepth}}}
       % when the block is done, disable the remaining
       \cftinsertcode{end-\thevubth@tocmarker}%
         {\normalchangetocdepth{\toclevel@none}}
       % remove the spacing above the toc title
       \undef{\tocheadstart}
       % remove the toc title itself
       \let\printtoctitle\@gobble% ok
       % remove space below title
       \undef{\aftertoctitle}
       % Note that if the \chapterprecistoc or \chapterprecis
       % has been used then that data is also added to the ToC data,
       % and we will need to locally disable it in the chapter ToC
       \let\precistoctext\@gobble% ok
       % reformat TOC entries:
       \deflength{\cftsectionindent}{\z@}
       \deflength{\cftsubsectionindent}{\cftsectionnumwidth}
       \deflength{\cftsubsubsectionindent}%
         {\cftsubsectionindent + \cftsubsectionnumwidth}
       \renewcommand*{\cftsectionfont}{\small}
       \renewcommand*{\cftsectionpagefont}{\small}
       \renewcommand*{\cftsubsectionfont}{\small}
       \renewcommand*{\cftsubsectionpagefont}{\small}
       \renewcommand*{\cftsubsubsectionfont}{\small}
       \renewcommand*{\cftsubsubsectionpagefont}{\small}
       % include the actual ToC data
       \tableofcontents*
     \endgroup
     % restore tocdepth, needed outside group because
     % memoirs internals use global setcounter commands
     \defcounter{tocdepth}{\value{vubth@chaptocdepth}}
     % to indent or not after the chapter toc
     \m@mindentafterchapter
     % space between chapter toc and text
     \par
     \bigskip
     % handles indentation after the macro
     \@afterheading}%
   {\let\chaptertoc\@empty}

% Appendix Toc
\ifbool{vubth@appendixtoc}%
  {\newcounter{vubth@apptocdepth}
   \renewcommand{\mempostaddapppagetotochook}%
     {\defcounter{vubth@apptocdepth}{\value{tocdepth}}
      \cftinserthook{toc}{appbreak}}
   % Keep everything after appendixpage out of the main
   % tableofcontents
   \cftinsertcode{appbreak}%
     {\normalchangetocdepth{\toclevel@none}}
```

```
    \newcommand*{\appendixtableofcontents}%
      {\begingroup
         \let\changetocdepth\@gobble% ok
         \normalchangetocdepth{\toclevel@none}
         \cftinsertcode{appbreak}%
           {\normalchangetocdepth{\value{vubth@apptocdepth}}}
         \ifbool{vubth@englishlang}%
           {\renewcommand*{\contentsname}{Appendices Overview}}%
           {\renewcommand*{\contentsname}{L\ij st van bijlagen}}
         \tableofcontents*
       \endgroup}}%
  {\let\appendixtableofcontents\@empty}

%-------------------------------------------------------------------------
% CONVENIENCE MACROS & ENVIRONMENTS

\newcommand*{\vubth@mttype}%
  {\ifbool{vubth@englishlang}%
     {\newcommand*{\thesistype}%
        {master's thesis}}%
     {\newcommand*{\thesistype}%
        {masterproef}}}

\ifdefstring{\vubth@thesistype}{bt}% Bachelor Thesis
  {\ifbool{vubth@englishlang}%
     {\newcommand*{\thesistype}%
        {bachelor's thesis}}%
     {\newcommand*{\thesistype}%
        {bachelorproef}}}%
  {\ifdefstring{\vubth@thesistype}{rt}% Research Training
     {\ifbool{vubth@englishlang}%
        {\newcommand*{\thesistype}%
           {research training}}%
        {\newcommand*{\thesistype}%
           {research training}}
       \toggletrue{researchtraining}}%
     {\ifdefstring{\vubth@thesistype}{mt}% Master Thesis
        {\vubth@mttype}%
        {\ifdefstring{\vubth@thesistype}{phd}% Ph.D. Thesis
           {\ifbool{vubth@englishlang}%
              {\newcommand*{\thesistype}%
                 {doctoral dissertation}}% or Ph.D. thesis
              {\newcommand*{\thesistype}%
                 {doctoraatsproef}}}%
           {\ClassWarningNoLine{vubthesis}%
              {Thesistype `\vubth@thesistype' undefined, `mt' assumed}
            \vubth@mttype}}}}

\newcommand*{\Thesistype}%
  {\xmakefirstuc{\thesistype}}
\newcommand*{\ThesisType}%
  {\xcapitalisewords{\thesistype}}

% User Interface to detect a digital
% versus a print version of the document.
\ifbool{vubth@digital}%
  {\toggletrue{digitalversion}}%
  {}

\newcommand*{\commandcode}[1]%
  {\texttt{#1}}

\newcommand*{\emptypage}%
  {\clearpage
   \thispagestyle{empty}
   \null
   \newpage}

\newcommand*{\born}[1]%
  {\borndied{#1}{}}
\newcommand*{\died}[1]%
  {\borndied{}{#1}}

\newcommand*{\borndied}[2]%
  {\notblank{#1}%
     {\begingroup
        \fontencoding{TS1}%
        \fontfamily{lmr}%
        \selectfont%
```

```
        \textborn%
      \endgroup
      ~#1%
      \notblank{#2}%
        {~--~#2~%
         \begingroup
           \fontencoding{TS1}%
           \fontfamily{lmr}%
           \selectfont%
           \textdied%
         \endgroup}%
        {}}%
     {\notblank{#2}%
        {#2~%
         \begingroup
           \fontencoding{TS1}%
           \fontfamily{lmr}%
           \selectfont%
           \textdied%
         \endgroup}%
        {}}}

% Attach the contents of a file by means
% of a symbol, currently a paper clip,
% in the margin of the text.
% The test on emptiness is not really
% necessary since an empty optional
% argument is parsed correctly by
% `attachfile'. Doing the test makes it
% future proof as LaTeX core macros
% sometimes make special use of optional
% parameters.
% Also possible:
% \textattachfile%
%   {earningsdata.csv}%
%   {Text and/or \includegraphics{earnings}}
% This code makes the text/image into
% a download link. Not used because this might
% confuse users when we decide to color
% document hyperlinks.
\ifbool{vubth@digital}%
  {\newcommand*{\attachfilecontents}[2][]%
     {\filename@parse{#2}
      \marginpar%
        {\centering
         \attachfile[#1]{#2}
         \\
         \footnotesize
         \filename@base%
         .%
         \filename@ext}}%
  {\newcommand*{\attachfilecontents}[2][]%
     {\@bsphack\@esphack}}

% Command to be used as the optional
% parameter to the vplace environment.
\newcommand*{\vstretchfactor}%
  {\strip@pt
   \dimexpr\p@/3\relax}

\newenvironment*{lboxrbox}%
  {\rule{1ex}{1ex}%
   \hspace{\stretch{1}}}%
  {\hspace{\stretch{1}}%
   \rule{1ex}{1ex}}

% Foreign Phrases Helper Macros
% We cannot simply test the class boolean
% since it depends on the current active
% language context. Just to be sure
% we test both `\IfLanguageName' and
% `\IfLanguagePatterns'. Normally a language
% loads the according hyphenation patterns
% automatically, but with this test we also
% cover hyphenrules environments (see csquotes).
% I.e. normally, we should only apply the second
% `\IfLanguagePatterns'. For these quotes,
% we only need active language hyphenrules.
\newcommand*{\vubth@englishphrase}[2][\@firstofone]%
```

```
  {\ifboolexpr%
     {test {\IfLanguageName{english}}
      or
      test {\IfLanguagePatterns{english}}
      or
      not bool {vubth@markforeignphrases}}%
     {\@firstofone}%
     {\textenglish}%
   {#1%
      {\iftoggle{abbrevenglish}%
         {\ifcsdef{vubth@ae#2}%
            {\csuse{vubth@ae#2}}%
            {\csuse{vubth@fe#2}}}%
         {\csuse{vubth@fe#2}}}}}

\newcommand*{\vubth@dutchphrase}[2][\@firstofone]%
  {\ifboolexpr%
     {test {\IfLanguageName{dutch}}
      or
      test {\IfLanguagePatterns{dutch}}
      or
      not bool {vubth@markforeignphrases}}%
     {\@firstofone}%
     {\textdutch}%
   {#1%
      {\iftoggle{abbrevdutch}%
         {\ifcsdef{vubth@ad#2}%
            {\csuse{vubth@ad#2}}%
            {\csuse{vubth@fd#2}}}%
         {\csuse{vubth@fd#2}}}}}

\newcommand*{\vubth@latinphrase}[2][\@firstofone]%
  {\ifboolexpr%
     {test {\IfLanguageName{latin}}
      or
      test {\IfLanguagePatterns{latin}}
      or
      not bool {vubth@markforeignphrases}}%
     {\@firstofone}%
     {\textlatin}%
   {#1%
      {\iftoggle{abbrevlatin}%
         {\ifcsdef{vubth@al#2}%
            {\csuse{vubth@al#2}}%
            {\csuse{vubth@fl#2}}}%
         {\csuse{vubth@fl#2}}}}}

% ***English Phrases User Interface***
% ***Lowercase***
\newcommand*{\sstm}%
  {\vubth@englishphrase{sstm}}
\newcommand*{\twowrongs}%
  {\vubth@englishphrase{twowrongs}}
\newcommand*{\thepen}%
  {\vubth@englishphrase{thepen}}
\newcommand*{\wheninrome}%
  {\vubth@englishphrase{wheninrome}}
\newcommand*{\thesqueakywheel}%
  {\vubth@englishphrase{thesqueakywheel}}
\newcommand*{\whenthegoing}%
  {\vubth@englishphrase{whenthegoing}}
\newcommand*{\noman}%
  {\vubth@englishphrase{noman}}
\newcommand*{\forturefavors}%
  {\vubth@englishphrase{forturefavors}}
\newcommand*{\peoplewholive}%
  {\vubth@englishphrase{peoplewholive}}
\newcommand*{\hopeforthebest}%
  {\vubth@englishphrase{hopeforthebest}}
\newcommand*{\betterlate}%
  {\vubth@englishphrase{betterlate}}
\newcommand*{\birdsofafeather}%
  {\vubth@englishphrase{birdsofafeather}}
\newcommand*{\keepyourfriends}%
  {\vubth@englishphrase{keepyourfriends}}
\newcommand*{\apicture}%
  {\vubth@englishphrase{apicture}}
\newcommand*{\theresnosuchthing}%
  {\vubth@englishphrase{theresnosuchthing}}
```

```
  \newcommand*{\theresnoplace}%
    {\vubth@englishphrase{theresnoplace}}
  \newcommand*{\discretionisthegreater}%
    {\vubth@englishphrase{discretionisthegreater}}
  \newcommand*{\theearlybird}%
    {\vubth@englishphrase{theearlybird}}
  \newcommand*{\neverlook}%
    {\vubth@englishphrase{neverlook}}
  \newcommand*{\youcantmakeanomelet}%
    {\vubth@englishphrase{youcantmakeanomelet}}
  \newcommand*{\godhelps}%
    {\vubth@englishphrase{godhelps}}
  \newcommand*{\youcantalwaysget}%
    {\vubth@englishphrase{youcantalwaysget}}
  \newcommand*{\cleanlinessisnext}%
    {\vubth@englishphrase{cleanlinessisnext}}
  \newcommand*{\awatchedpot}%
    {\vubth@englishphrase{awatchedpot}}
  \newcommand*{\beggarscantbe}%
    {\vubth@englishphrase{beggarscantbe}}
  \newcommand*{\actionsspeak}%
    {\vubth@englishphrase{actionsspeak}}
  \newcommand*{\ifaintbroke}%
    {\vubth@englishphrase{ifaintbroke}}
  \newcommand*{\practicemakesperfect}%
    {\vubth@englishphrase{practicemakesperfect}}
  \newcommand*{\toomanycooks}%
    {\vubth@englishphrase{toomanycooks}}
  \newcommand*{\easycome}%
    {\vubth@englishphrase{easycome}}
  \newcommand*{\dontbite}%
    {\vubth@englishphrase{dontbite}}
  \newcommand*{\allgoodthings}%
    {\vubth@englishphrase{allgoodthings}}
  \newcommand*{\ifyoucantbeat}%
    {\vubth@englishphrase{ifyoucantbeat}}
  \newcommand*{\onemanstrash}%
    {\vubth@englishphrase{onemanstrash}}
  \newcommand*{\theresnotime}%
    {\vubth@englishphrase{theresnotime}}
  \newcommand*{\beautyisintheeye}%
    {\vubth@englishphrase{beautyisintheeye}}
  \newcommand*{\necessityisthemother}%
    {\vubth@englishphrase{necessityisthemother}}
  \newcommand*{\apennysaved}%
    {\vubth@englishphrase{apennysaved}}
  \newcommand*{\familiaritybreeds}%
    {\vubth@englishphrase{familiaritybreeds}}
  \newcommand*{\youcantjudge}%
    {\vubth@englishphrase{youcantjudge}}
  \newcommand*{\goodthings}%
    {\vubth@englishphrase{goodthings}}
  \newcommand*{\dontpullallyoureggs}%
    {\vubth@englishphrase{dontpullallyoureggs}}
  \newcommand*{\twoheads}%
    {\vubth@englishphrase{twoheads}}
  \newcommand*{\thegrass}%
    {\vubth@englishphrase{thegrass}}
  \newcommand*{\dountoothers}%
    {\vubth@englishphrase{dountoothers}}
  \newcommand*{\achain}%
    {\vubth@englishphrase{achain}}
  \newcommand*{\honestyisthebest}%
    {\vubth@englishphrase{honestyisthebest}}
  \newcommand*{\absencemakestheheart}%
    {\vubth@englishphrase{absencemakestheheart}}
  \newcommand*{\youcanleadahorse}%
    {\vubth@englishphrase{youcanleadahorse}}
  \newcommand*{\dontcountyourchickens}%
    {\vubth@englishphrase{dontcountyourchickens}}
  \newcommand*{\ifyouwantsomething}%
    {\vubth@englishphrase{ifyouwantsomething}}
  \newcommand*{\abrokenclock}%
    {\vubth@englishphrase{abrokenclock}}
  \newcommand*{\afriendinneed}%
    {\vubth@englishphrase{afriendinneed}}
  \newcommand*{\alittlebit}%
    {\vubth@englishphrase{alittlebit}}
  \newcommand*{\ajourney}%
```

```
    {\vubth@englishphrase{ajourney}}
  \newcommand*{\allisfair}%
    {\vubth@englishphrase{allisfair}}
  \newcommand*{\allwork}%
    {\vubth@englishphrase{allwork}}
  \newcommand*{\bettersafe}%
    {\vubth@englishphrase{bettersafe}}
  \newcommand*{\betterthedevil}%
    {\vubth@englishphrase{betterthedevil}}
  \newcommand*{\dontjudgeaman}%
    {\vubth@englishphrase{dontjudgeaman}}
  \newcommand*{\dontputthecart}%
    {\vubth@englishphrase{dontputthecart}}
  \newcommand*{\donttalkthetalk}%
    {\vubth@englishphrase{donttalkthetalk}}
  \newcommand*{\dontthrowout}%
    {\vubth@englishphrase{dontthrowout}}
  \newcommand*{\earlytobed}%
    {\vubth@englishphrase{earlytobed}}
  \newcommand*{\everycloud}%
    {\vubth@englishphrase{everycloud}}
  \newcommand*{\giveaman}%
    {\vubth@englishphrase{giveaman}}
  \newcommand*{\greatminds}%
    {\vubth@englishphrase{greatminds}}
  \newcommand*{\hastemakeswaste}%
    {\vubth@englishphrase{hastemakeswaste}}
  \newcommand*{\hindsighttwenty}%
    {\vubth@englishphrase{hindsighttwenty}}
  \newcommand*{\dontsucceed}%
    {\vubth@englishphrase{dontsucceed}}
  \newcommand*{\ifwisheswerehorses}%
    {\vubth@englishphrase{ifwisheswerehorses}}
  \newcommand*{\ifyousnooze}%
    {\vubth@englishphrase{ifyousnooze}}
  \newcommand*{\anythingnice}%
    {\vubth@englishphrase{anythingnice}}
  \newcommand*{\partsolution}%
    {\vubth@englishphrase{partsolution}}
  \newcommand*{\nousecrying}%
    {\vubth@englishphrase{nousecrying}}
  \newcommand*{\fatladysings}%
    {\vubth@englishphrase{fatladysings}}
  \newcommand*{\jackofalltrades}%
    {\vubth@englishphrase{jackofalltrades}}
  \newcommand*{\knowledgeispower}%
    {\vubth@englishphrase{knowledgeispower}}
  \newcommand*{\liedownwithdogs}%
    {\vubth@englishphrase{liedownwithdogs}}
  \newcommand*{\lookbeforeyouleap}%
    {\vubth@englishphrase{lookbeforeyouleap}}
  \newcommand*{\measuretwice}%
    {\vubth@englishphrase{measuretwice}}
  \newcommand*{\miserylovescompany}%
    {\vubth@englishphrase{miserylovescompany}}
  \newcommand*{\neverputoff}%
    {\vubth@englishphrase{neverputoff}}
  \newcommand*{\powercorrupts}%
    {\vubth@englishphrase{powercorrupts}}
  \newcommand*{\romewasntbuilt}%
    {\vubth@englishphrase{romewasntbuilt}}
  \newcommand*{\slowandsteady}%
    {\vubth@englishphrase{slowandsteady}}
  \newcommand*{\stillwaters}%
    {\vubth@englishphrase{stillwaters}}
  \newcommand*{\strikewhiletheiron}%
    {\vubth@englishphrase{strikewhiletheiron}}
  \newcommand*{\theapple}%
    {\vubth@englishphrase{theapple}}
  \newcommand*{\theroadtohell}%
    {\vubth@englishphrase{theroadtohell}}
  \newcommand*{\mansheart}%
    {\vubth@englishphrase{mansheart}}
  \newcommand*{\badpublicity}%
    {\vubth@englishphrase{badpublicity}}
  \newcommand*{\timeismoney}%
    {\vubth@englishphrase{timeismoney}}
  \newcommand*{\twoiscompany}%
    {\vubth@englishphrase{twoiscompany}}
```

```
\newcommand*{\whatgoesaround}%
  {\vubth@englishphrase{whatgoesaround}}
\newcommand*{\whatgoesup}%
  {\vubth@englishphrase{whatgoesup}}
\newcommand*{\whatsgoodforthegoose}%
  {\vubth@englishphrase{whatsgoodforthegoose}}
\newcommand*{\catchmoreflies}%
  {\vubth@englishphrase{catchmoreflies}}
\newcommand*{\haveyourcake}%
  {\vubth@englishphrase{haveyourcake}}
\newcommand*{\teacholddog}%
  {\vubth@englishphrase{teacholddog}}
\newcommand*{\youreap}%
  {\vubth@englishphrase{youreap}}
\newcommand*{\alsoknownas}%
  {\vubth@englishphrase{alsoknownas}}

% ***Uppercase First Letter***
\newcommand*{\Sstm}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {sstm}}
\newcommand*{\Twowrongs}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {twowrongs}}
\newcommand*{\Thepen}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {thepen}}
\newcommand*{\Wheninrome}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {wheninrome}}
\newcommand*{\Thesqueakywheel}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {thesqueakywheel}}
\newcommand*{\Whenthegoing}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {whenthegoing}}
\newcommand*{\Noman}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {noman}}
\newcommand*{\Forturefavors}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {forturefavors}}
\newcommand*{\Peoplewholive}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {peoplewholive}}
\newcommand*{\Hopeforthebest}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {hopeforthebest}}
\newcommand*{\Betterlate}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {betterlate}}
\newcommand*{\Birdsofafeather}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {birdsofafeather}}
\newcommand*{\Keepyourfriends}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {keepyourfriends}}
\newcommand*{\Apicture}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {apicture}}
\newcommand*{\Theresnosuchthing}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {theresnosuchthing}}
\newcommand*{\Theresnoplace}%
```

```
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {theresnoplace}}
\newcommand*{\Discretionisthegreater}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {discretionisthegreater}}
\newcommand*{\Theearlybird}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {theearlybird}}
\newcommand*{\Neverlook}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {neverlook}}
\newcommand*{\Youcantmakeanomelet}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {youcantmakeanomelet}}
\newcommand*{\Godhelps}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {godhelps}}
\newcommand*{\Youcantalwaysget}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {youcantalwaysget}}
\newcommand*{\Cleanlinessisnext}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {cleanlinessisnext}}
\newcommand*{\Awatchedpot}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {awatchedpot}}
\newcommand*{\Beggarscantbe}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {beggarscantbe}}
\newcommand*{\Actionsspeak}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {actionsspeak}}
\newcommand*{\Ifaintbroke}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {ifaintbroke}}
\newcommand*{\Practicemakesperfect}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {practicemakesperfect}}
\newcommand*{\Toomanycooks}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {toomanycooks}}
\newcommand*{\Easycome}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {easycome}}
\newcommand*{\Dontbite}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontbite}}
\newcommand*{\Allgoodthings}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {allgoodthings}}
\newcommand*{\Ifyoucantbeat}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {ifyoucantbeat}}
\newcommand*{\Onemanstrash}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {onemanstrash}}
\newcommand*{\Theresnotime}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {theresnotime}}
```

```
\newcommand*{\Beautyisintheeye}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {beautyisintheeye}}
\newcommand*{\Necessityisthemother}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {necessityisthemother}}
\newcommand*{\Apennysaved}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {apennysaved}}
\newcommand*{\Familiaritybreeds}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {familiaritybreeds}}
\newcommand*{\Youcantjudge}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {youcantjudge}}
\newcommand*{\Goodthings}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {goodthings}}
\newcommand*{\Dontpullallyoureggs}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontpullallyoureggs}}
\newcommand*{\Twoheads}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {twoheads}}
\newcommand*{\Thegrass}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {thegrass}}
\newcommand*{\Dountoothers}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dountoothers}}
\newcommand*{\Achain}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {achain}}
\newcommand*{\Honestyisthebest}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {honestyisthebest}}
\newcommand*{\Absencemakestheheart}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {absencemakestheheart}}
\newcommand*{\Youcanleadahorse}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {youcanleadahorse}}
\newcommand*{\Dontcountyourchickens}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontcountyourchickens}}
\newcommand*{\Ifyouwantsomething}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {ifyouwantsomething}}
\newcommand*{\Abrokenclock}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {abrokenclock}}
\newcommand*{\Afriendinneed}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {afriendinneed}}
\newcommand*{\Alittlebit}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {alittlebit}}
\newcommand*{\Ajourney}%
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     [\emakefirstuc]%
```

```
    {ajourney}}
\newcommand*{\Allisfair}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {allisfair}}
\newcommand*{\Allwork}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {allwork}}
\newcommand*{\Bettersafe}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {bettersafe}}
\newcommand*{\Betterthedevil}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {betterthedevil}}
\newcommand*{\Dontjudgeaman}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontjudgeaman}}
\newcommand*{\Dontputthecart}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontputthecart}}
\newcommand*{\Donttalkthetalk}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {donttalkthetalk}}
\newcommand*{\Dontthrowout}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {dontthrowout}}
\newcommand*{\Earlytobed}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {earlytobed}}
\newcommand*{\Everycloud}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {everycloud}}
\newcommand*{\Giveaman}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {giveaman}}
\newcommand*{\Greatminds}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {greatminds}}
\newcommand*{\Hastemakeswaste}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {hastemakeswaste}}
\newcommand*{\Hindsighttwenty}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {hindsighttwenty}}
\newcommand*{\Dontsucceed}%
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     {dontsucceed}}
\newcommand*{\Ifwisheswerehorses}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {ifwisheswerehorses}}
\newcommand*{\Ifyousnooze}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {ifyousnooze}}
\newcommand*{\Anythingnice}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {anythingnice}}
\newcommand*{\Partsolution}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {partsolution}}
\newcommand*{\Nousecrying}%
  {\vubth@englishphrase%
```

```
      [\emakefirstuc]%
      {nousecrying}}
\newcommand*{\Fatladysings}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {fatladysings}}
\newcommand*{\Jackofalltrades}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {jackofalltrades}}
\newcommand*{\Knowledgeispower}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {knowledgeispower}}
\newcommand*{\Liedownwithdogs}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {liedownwithdogs}}
\newcommand*{\Lookbeforeyouleap}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {lookbeforeyouleap}}
\newcommand*{\Measuretwice}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {measuretwice}}
\newcommand*{\Miserylovescompany}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {miserylovescompany}}
\newcommand*{\Neverputoff}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {neverputoff}}
\newcommand*{\Powercorrupts}%
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      [\emakefirstuc]%
      {powercorrupts}}
\newcommand*{\Romewasntbuilt}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {romewasntbuilt}}
\newcommand*{\Slowandsteady}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {slowandsteady}}
\newcommand*{\Stillwaters}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {stillwaters}}
\newcommand*{\Strikewhiletheiron}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {strikewhiletheiron}}
\newcommand*{\Theapple}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {theapple}}
\newcommand*{\Theroadtohell}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {theroadtohell}}
\newcommand*{\Mansheart}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {mansheart}}
\newcommand*{\Badpublicity}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {badpublicity}}
\newcommand*{\Timeismoney}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {timeismoney}}
\newcommand*{\Twoiscompany}%
  {\vubth@englishphrase%
      [\emakefirstuc]%
      {twoiscompany}}
\newcommand*{\Whatgoesaround}%
```

```
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {whatgoesaround}}
\newcommand*{\Whatgoesup}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {whatgoesup}}
\newcommand*{\Whatsgoodforthegoose}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {whatsgoodforthegoose}}
\newcommand*{\Catchmoreflies}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {catchmoreflies}}
\newcommand*{\Haveyourcake}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {haveyourcake}}
\newcommand*{\Teacholddog}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {teacholddog}}
\newcommand*{\Youreap}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {youreap}}
\newcommand*{\Alsoknownas}%
  {\vubth@englishphrase%
     [\emakefirstuc]%
     {alsoknownas}}

% Camel Casing (Pascal Casing)
\newcommand*{\SSTM}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {sstm}}
\newcommand*{\TwoWrongs}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {twowrongs}}
\newcommand*{\ThePen}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {thepen}}
\newcommand*{\WhenInRome}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {wheninrome}}
\newcommand*{\TheSqueakyWheel}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {thesqueakywheel}}
\newcommand*{\WhenTheGoing}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {whenthegoing}}
\newcommand*{\NoMan}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {noman}}
\newcommand*{\FortureFavors}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {forturefavors}}
\newcommand*{\PeopleWhoLive}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {peoplewholive}}
\newcommand*{\HopeForTheBest}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {hopeforthebest}}
\newcommand*{\BetterLate}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {betterlate}}
\newcommand*{\BirdsOfAFeather}%
  {\vubth@englishphrase%
```

```
      [\ecapitalisewords]%
      {birdsofafeather}}
\newcommand*{\KeepYourFriends}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {keepyourfriends}}
\newcommand*{\APicture}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {apicture}}
\newcommand*{\TheresNoSuchThing}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {theresnosuchthing}}
\newcommand*{\TheresNoPlace}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {theresnoplace}}
\newcommand*{\DiscretionIsTheGreater}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {discretionisthegreater}}
\newcommand*{\TheEarlyBird}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {theearlybird}}
\newcommand*{\NeverLook}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {neverlook}}
\newcommand*{\YouCantMakeAnOmelet}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {youcantmakeanomelet}}
\newcommand*{\GodHelps}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {godhelps}}
\newcommand*{\YouCantAlwaysGet}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {youcantalwaysget}}
\newcommand*{\CleanlinessIsNext}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {cleanlinessisnext}}
\newcommand*{\AWatchedPot}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {awatchedpot}}
\newcommand*{\BeggarsCantBe}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {beggarscantbe}}
\newcommand*{\ActionsSpeak}%
  {\vubth@englishphrase%
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      {actionsspeak}}
\newcommand*{\IfAintBroke}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {ifaintbroke}}
\newcommand*{\PracticeMakesPerfect}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {practicemakesperfect}}
\newcommand*{\TooManyCooks}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {toomanycooks}}
\newcommand*{\EasyCome}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {easycome}}
\newcommand*{\DontBite}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {dontbite}}
\newcommand*{\AllGoodThings}%
```

```
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {allgoodthings}}
\newcommand*{\IfYouCantBeat}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {ifyoucantbeat}}
\newcommand*{\OneMansTrash}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {onemanstrash}}
\newcommand*{\TheresNoTime}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {theresnotime}}
\newcommand*{\BeautyIsInTheEye}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {beautyisintheeye}}
\newcommand*{\NecessityIsTheMother}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {necessityisthemother}}
\newcommand*{\APennySaved}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {apennysaved}}
\newcommand*{\FamiliarityBreeds}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {familiaritybreeds}}
\newcommand*{\YouCantJudge}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {youcantjudge}}
\newcommand*{\GoodThings}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {goodthings}}
\newcommand*{\DontPullAllYourEggs}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontpullallyoureggs}}
\newcommand*{\TwoHeads}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {twoheads}}
\newcommand*{\TheGrass}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {thegrass}}
\newcommand*{\DoUntoOthers}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dountoothers}}
\newcommand*{\AChain}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {achain}}
\newcommand*{\HonestyIsTheBest}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {honestyisthebest}}
\newcommand*{\AbsenceMakesTheHeart}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {absencemakestheheart}}
\newcommand*{\YouCanLeadAHorse}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {youcanleadahorse}}
\newcommand*{\DontCountYourChickens}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontcountyourchickens}}
\newcommand*{\IfYouWantSomething}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {ifyouwantsomething}}
```

```
\newcommand*{\ABrokenClock}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {abrokenclock}}
\newcommand*{\AFriendInNeed}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {afriendinneed}}
\newcommand*{\ALittleBit}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {alittlebit}}
\newcommand*{\AJourney}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {ajourney}}
\newcommand*{\AllIsFair}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {allisfair}}
\newcommand*{\AllWork}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {allwork}}
\newcommand*{\BetterSafe}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {bettersafe}}
\newcommand*{\BetterTheDevil}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {betterthedevil}}
\newcommand*{\DontJudgeAMan}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontjudgeaman}}
\newcommand*{\DontPutTheCart}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontputthecart}}
\newcommand*{\DontTalkTheTalk}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {donttalkthetalk}}
\newcommand*{\DontThrowOut}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontthrowout}}
\newcommand*{\EarlyToBed}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {earlytobed}}
\newcommand*{\EveryCloud}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {everycloud}}
\newcommand*{\GiveAMan}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {giveaman}}
\newcommand*{\GreatMinds}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {greatminds}}
\newcommand*{\HasteMakesWaste}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {hastemakeswaste}}
\newcommand*{\HindsightTwenty}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {hindsighttwenty}}
\newcommand*{\DontSucceed}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
     {dontsucceed}}
\newcommand*{\IfWishesWereHorses}%
  {\vubth@englishphrase%
     [\ecapitalisewords]%
```

```
    {ifwisheswerehorses}}
\newcommand*{\IfYouSnooze}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {ifyousnooze}}
\newcommand*{\AnythingNice}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {anythingnice}}
\newcommand*{\PartSolution}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {partsolution}}
\newcommand*{\NoUseCrying}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {nousecrying}}
\newcommand*{\FatLadySings}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {fatladysings}}
\newcommand*{\JackOfAllTrades}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {jackofalltrades}}
\newcommand*{\KnowledgeIsPower}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {knowledgeispower}}
\newcommand*{\LieDownWithDogs}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {liedownwithdogs}}
\newcommand*{\LookBeforeYouLeap}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {lookbeforeyouleap}}
\newcommand*{\MeasureTwice}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {measuretwice}}
\newcommand*{\MiseryLovesCompany}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {miserylovescompany}}
\newcommand*{\NeverPutOff}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {neverputoff}}
\newcommand*{\PowerCorrupts}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {powercorrupts}}
\newcommand*{\RomeWasntBuilt}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {romewasntbuilt}}
\newcommand*{\SlowAndSteady}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {slowandsteady}}
\newcommand*{\StillWaters}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {stillwaters}}
\newcommand*{\StrikeWhileTheIron}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {strikewhiletheiron}}
\newcommand*{\TheApple}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {theapple}}
\newcommand*{\TheRoadToHell}%
  {\vubth@englishphrase%
    [\ecapitalisewords]%
    {theroadtohell}}
\newcommand*{\MansHeart}%
  {\vubth@englishphrase%
```

```
      [\ecapitalisewords]%
      {mansheart}}
\newcommand*{\BadPublicity}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {badpublicity}}
\newcommand*{\TimeIsMoney}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {timeismoney}}
\newcommand*{\TwoIsCompany}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {twoiscompany}}
\newcommand*{\WhatGoesAround}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {whatgoesaround}}
\newcommand*{\WhatGoesUp}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {whatgoesup}}
\newcommand*{\WhatsGoodForTheGoose}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {whatsgoodforthegoose}}
\newcommand*{\CatchMoreFlies}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {catchmoreflies}}
\newcommand*{\HaveYourCake}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {haveyourcake}}
\newcommand*{\TeachOldDog}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {teacholddog}}
\newcommand*{\YouReap}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {youreap}}
\newcommand*{\AlsoKnownAs}%
  {\vubth@englishphrase%
      [\ecapitalisewords]%
      {alsoknownas}}

% Full English Phrases
% The Simpsons: Springfield town motto
\newcommand*{\vubth@fesstm}%
  {a noble spirit embiggens the smallest man}
% When someone has done something bad to you,
% trying to get revenge will only make things worse.
\newcommand*{\vubth@fetwowrongs}%
  {two wrongs don't make a right}
% Trying to convince people with ideas and words is
% more effective than trying to force people to do what you want.
\newcommand*{\vubth@fethepen}%
  {the pen is mightier than the sword}
% Act the way that the people around you are acting.
% This phrase might come in handy when you're traveling abroad
% notice that people do things differently than you're used to.
\newcommand*{\vubth@fewheninrome}%
  {when in Rome, do as the Romans}
% You can get better service if you complain about something.
% If you wait patiently, no one's going to help you.
\newcommand*{\vubth@fethesqueakywheel}%
  {the squeaky wheel gets the grease}
% Strong people don't give up when they come across challenges.
% They just work harder.
\newcommand*{\vubth@fewhenthegoing}%
  {when the going gets tough, the tough get going}
% You can't live completely independently.
% Everyone needs help from other people.
\newcommand*{\vubth@fenoman}%
  {no man is an island}
% People who bravely go after what they want are more successful
% than people who try to live safely.
\newcommand*{\vubth@feforturefavors}%
```

```
  {fortune favors the bold}
% Don't criticize other people if you're not perfect yourself.
\newcommand*{\vubth@fepeoplewholive}%
  {people who live in glass houses should not throw stones}
% Bad things might happen, so be prepared.
\newcommand*{\vubth@fehopeforthebest}%
  {hope for the best, but prepare for the worst}
% It's best to do something on time.
% But if you can't do it on time, do it late.
\newcommand*{\vubth@febetterlate}%
  {better late than never}
% People like to spend time with others who are similar to them.
\newcommand*{\vubth@febirdsofafeather}%
  {birds of a feather flock together}
% If you have an enemy, pretend to be friends with them
% instead of openly fighting with them.
% That way you can watch them carefully and figure out
% what they're planning.
\newcommand*{\vubth@fekeepyourfriends}%
  {keep your friends close and your enemies closer}
% Pictures convey emotions and messages better than
% written or spoken explanations.
\newcommand*{\vubth@feapicture}%
  {a picture is worth a thousand words}
% Things that are offered for free always have a hidden cost.
\newcommand*{\vubth@fetheresnosuchthing}%
  {there's no such thing as a free lunch}
% Your own home is the most comfortable place to be.
\newcommand*{\vubth@fetheresnoplace}%
  {there's no place like home}
% Sometimes it's important to know when to give up and run away,
% instead of always acting brave and maybe getting hurt.
\newcommand*{\vubth@fediscretionisthegreater}%
  {discretion is the greater part of valor}
% You should wake up and start work early if you want to succeed.
\newcommand*{\vubth@fetheearlybird}%
  {The early bird catches the worm}
% If someone offers you a gift, don't question it.
\newcommand*{\vubth@feneverlook}%
  {never look a gift horse in the mouth}
% When you try to do something great, you'll probably make
% a few people annoyed or angry.
% Don't worry about those people; just focus on the good results.
\newcommand*{\vubth@feyoucantmakeanomelet}%
  {you can't make an omelet without breaking a few eggs}
% Don't just wait for good things to happen to you.
% Work hard to achieve your goals.
\newcommand*{\vubth@fegodhelps}%
  {God helps those who help themselves}
% Don't whine and complain if you don't get what you wanted.
\newcommand*{\vubth@feyoucantalwaysget}%
  {you can't always get what you want}
% Be clean. God likes that.
\newcommand*{\vubth@fecleanlinessisnext}%
  {cleanliness is next to godliness}
% If something takes time to finish, don't watch it too closely
% because it will seem like it's taking forever.
\newcommand*{\vubth@feawatchedpot}%
  {a watched pot never boils}
% If you're asking for a favor from someone else,
% you have to take whatever they give you.
\newcommand*{\vubth@febeggarscantbe}%
  {beggars can't be choosers}
% Just saying that you'll do something doesn't mean much.
% Actually doing it is harder and more meaningful.
\newcommand*{\vubth@feactionsspeak}%
  {actions speak louder than words}
% Don't try to improve something that already works fairly well.
% You'll probably end up causing new problems.
\newcommand*{\vubth@feifaintbroke}%
  {if it ain't broke, don't fix it}
% You have to practice a skill a lot to become good at it.
\newcommand*{\vubth@fepracticemakesperfect}%
  {practice makes perfect}
% When there are too many people trying to lead and give
% their opinions, it's confusing and leads to bad results.
% Jobs and projects should have one or two strong leaders.
\newcommand*{\vubth@fetoomanycooks}%
  {too many cooks spoil the broth}
```

```
% When you get money quickly, like by winning it,
% it's easy to spend it or lose it quickly as well.
\newcommand*{\vubth@feeasycome}%
  {easy come, easy go}
% If someone's paying you or helping you out,
% you have to be careful not to make them angry
% or say bad things about them.
\newcommand*{\vubth@fedontbite}%
  {don't bite the hand that feeds you}
% You can't keep having good luck or fun forever;
% eventually it will stop.
\newcommand*{\vubth@feallgoodthings}%
  {all good things must come to an end}
% When you try to change someone's behavior and it doesn't work,
% you might have to change instead.
% For example, if you're trying to get your classmates to focus
% on studying but they want to party,
% maybe you should just party with them.
\newcommand*{\vubth@feifyoucantbeat}%
  {if you can't beat 'em, join 'em}
% Different people have different ideas about what's valuable.
\newcommand*{\vubth@feonemanstrash}%
  {one man's trash is another man's treasure}
% If you need to do something, don't wait until later. Do it now.
\newcommand*{\vubth@fetheresnotime}%
  {there's no time like the present}
% Different people have different ideas about what's beautiful.
\newcommand*{\vubth@febeautyisintheeye}%
  {beauty is in the eye of the beholder}
% When you're really in need,
% you think of creative solutions to your problems.
\newcommand*{\vubth@fenecessityisthemother}%
  {necessity is the mother of invention}
% Save your money.
% Saving money is just like making money.
\newcommand*{\vubth@feapennysaved}%
  {a penny saved is a penny earned}
% When you're around someone for too long,
% you get tired of them and annoyed by them.
\newcommand*{\vubth@fefamiliaritybreeds}%
  {familiarity breeds contempt}
% Things sometimes look different than they really are.
% A restaurant that looks old and small might have amazing food,
% for example.
\newcommand*{\vubth@feyoucantjudge}%
  {you can't judge a book by its cover}
% Be patient.
% Eventually something good will happen to you.
\newcommand*{\vubth@fegoodthings}%
  {good things come to those who wait}
% Have a backup plan.
% Don't risk all of your money or time in one plan.
\newcommand*{\vubth@fedontpullallyoureggs}%
  {don't put all your eggs in one basket}
% When two people cooperate with each other,
% they come up with better ideas.
\newcommand*{\vubth@fetwoheads}%
  {two heads are better than one}
% People tend to want whatever they don't have.
\newcommand*{\vubth@fethegrass}%
  {the grass is always greener on the other side of the hill}
% Don't do mean things to people.
\newcommand*{\vubth@fedountoothers}%
  {do unto others as you would have them do unto you}
% If one member of a team doesn't perform well,
% the whole team will fail.
\newcommand*{\vubth@feachain}%
  {a chain is only as strong as its weakest link}
% Don't lie.
\newcommand*{\vubth@fehonestyisthebest}%
  {honesty is the best policy}
% Sometimes it's good to be away from your partner,
% because it makes you want to see each other again.
\newcommand*{\vubth@feabsencemakestheheart}%
  {absence makes the heart grow fonder}
% If you try to help someone, but they don't take your advice
% or offers, give up.
% You can't force someone to accept your help.
\newcommand*{\vubth@feyoucanleadahorse}%
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  {you can lead a horse to water, but you can't make him drink}
% Your plans might not work out, so don't start thinking about
% what you'll do after you succeed.
% Wait until you've already succeeded,
% and then you can think about what to do next.
\newcommand*{\vubth@fedontcountyourchickens}%
  {don't count your chickens before they hatch}
% Don't trust other people to do important things for you.
% You have to do things yourself to control the quality
% of the results.
\newcommand*{\vubth@feifyouwantsomething}%
  {if you want something done right, you have to do it yourself}
% When an old clock stops working, it shows one specific time
% but doesn't move.
% So once in the day and once at night, the clock is pointing
% to the correct time.
% In the same way, even a person who's not very smart can
% sometimes be correct by accident.
\newcommand*{\vubth@feabrokenclock}%
  {a broken clock is right twice a day}
% If someone helps you when you're in trouble,
% that person is a true friend.
\newcommand*{\vubth@feafriendinneed}%
  {a friend in need is a friend indeed}
% Sometimes when a person knows a little bit about something,
% they feel like they're an expert.
% Because they feel like an expert, they try to do things
% that they shouldn't and they mess everything up.
\newcommand*{\vubth@fealittlebit}%
  {a little bit of knowledge is a dangerous thing}
% Some things, like learning to speak English fluently,
% take a really long time.
% It might seem like too much work.
% But the only way to achieve your goals is to start working now.
\newcommand*{\vubth@feajourney}%
  {a journey of a thousand miles begins with a single step}
% In love and romance, you sometimes do things
% that aren't very nice.
% For example, you might break up with someone or steal
% another person's partner.
% This phrase means that that's OK.
\newcommand*{\vubth@feallisfair}%
  {all is fair in love and war}
% You can't work all of the time.
% You have to relax as well.
\newcommand*{\vubth@feallwork}%
  {all work and no play makes Jack a dull boy}
% You should be careful, even if it seems like it's not necessary.
% The consequences if something goes wrong are much worse
% than wasting a little time and effort by being careful.
\newcommand*{\vubth@febettersafe}%
  {better safe than sorry}
% When you have a choice between two bad things,
% it's safer to pick the bad thing that
% you've already experienced.
% The other bad thing might be worse.
\newcommand*{\vubth@febetterthedevil}%
  {better the devil you know than the one you don't}
% Sometimes people criticize each other.
% But it's not fair to criticize someone else
% if you haven't had the same experiences.
\newcommand*{\vubth@fedontjudgeaman}%
  {don't judge a man until you have walked a mile in his shoes}
% Pay attention to what's most important.
% Don't let things which aren't as important take up
% all of your time and attention.
\newcommand*{\vubth@fedontputthecart}%
  {don't put the cart before the horse}
% You shouldn't brag about being able to do something
% if you can't actually do it.
\newcommand*{\vubth@fedonttalkthetalk}%
  {don't talk the talk if you can't walk the walk}
% When you're trying to get rid of something bad,
% you might accidentally get rid of the good things
% that are connected with it as well. Don't do that.
\newcommand*{\vubth@fedontthrowout}%
  {don't throw out the baby with the bath water}
% This is a quotation from the famous American inventor
% and diplomat Benjamin Franklin.
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% It means it's healthy and smart to go to sleep early
% and wake up early.
\newcommand*{\vubth@feearlytobed}%
  {early to bed and early to rise makes a man healthy, wealthy and wise}
% When something bad happens to you, don't get too upset.
% There's usually something good associated with any bad experience.
% For example, if you get fired from your job,
% it might push you to get a better job instead.
\newcommand*{\vubth@feeverycloud}%
  {every cloud has a silver lining}
% Don't try to help people by just giving them things.
% The result will be temporary.
% If you want to help someone long-term,
% teach them how to do things on their own.
\newcommand*{\vubth@fegiveaman}%
  {give a man a fish, he eats for a day.
   Teach a man how to fish, he eats for a lifetime}
% Smart people often have the same ideas.
% Say this when someone has the same smart idea that you have.
\newcommand*{\vubth@fegreatminds}%
  {great minds think alike}
% When you try to work too quickly, you make mistakes.
% That can waste time, money, or materials.
% So slow down.
\newcommand*{\vubth@fehastemakeswaste}%
  {haste makes waste}
% It's easy to know what you should have done in the past,
% but making correct decisions is harder in the moment.
% This phrase means that you shouldn't judge someone's
% past decisions based on the information you know now.
\newcommand*{\vubth@fehindsighttwenty}%
  {hindsight is 20/20}
% Keep working hard and trying to succeed,
% even if you fail at first.
\newcommand*{\vubth@fedontsucceed}%
  {if at first you don't succeed, try, try again}
% Don't spend a lot of time wishing for things.
% Wishes are useless.
% Instead of wishing, you should work hard to achieve your goals.
\newcommand*{\vubth@feifwisheswerehorses}%
  {if wishes were horses, beggars would ride}
% You have to act quickly to get the things you want.
\newcommand*{\vubth@feifyousnooze}%
  {if you snooze, you lose}
% Don't say mean things about other people.
\newcommand*{\vubth@feanythingnice}%
  {if you don't have anything nice to say,
   don't say anything at all}
% Don't just complain about problems that you see.
% Do something to solve the problems.
\newcommand*{\vubth@fepartsolution}%
  {if you're not part of the solution,
   you're part of the problem}
% If you break something, lose money, etc.,
% don't get too upset about it.
% It's already happened, so getting upset isn't useful.
\newcommand*{\vubth@fenousecrying}%
  {it's no use crying over spilled milk}
% Say this in a competition or game.
% When other people think that the result
% has already been decided,
% but you're not ready to admit that it's finished,
% use this phrase.
\newcommand*{\vubth@fefatladysings}%
  {it's not over 'till the fat lady sings}
% Someone who is good at a lot of different skills
% is usually not very good at any of them.
\newcommand*{\vubth@fejackofalltrades}%
  {jack of all trades, master of none}
% You should try to learn a lot.
% Knowing more things makes you more powerful.
\newcommand*{\vubth@feknowledgeispower}%
  {knowledge is power}
% If you associate with dishonest people,
% bad things will happen to you.
\newcommand*{\vubth@feliedownwithdogs}%
  {lie down with dogs, wake up with fleas}
% Make decisions carefully.
% Don't make a decision without thinking
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% about it and researching it carefully.
\newcommand*{\vubth@felookbeforeyouleap}%
  {look before you leap}
% Once you've made some decisions, it's hard to change it.
% Think carefully before making a decision.
\newcommand*{\vubth@femeasuretwice}%
  {measure twice, cut once}
% People who are unhappy want to make other people unhappy too.
\newcommand*{\vubth@femiserylovescompany}%
  {misery loves company}
% Don't be lazy.
% If you have some work that you need to do, do it now.
% Don't wait to do it later.
\newcommand*{\vubth@feneverputoff}%
  {never put off till (until) tomorrow what you can do today}
% When people get power, they always do mean, dishonest things.
% We shouldn't allow anyone to have too much power.
\newcommand*{\vubth@fepowercorrupts}%
  {power corrupts, and absolute power corrupts absolutely}
% Doing important work takes a long time.
% Be patient.
\newcommand*{\vubth@feromewasntbuilt}%
  {Rome wasn't built in a day}
% You shouldn't use all of your energy at the beginning of a project.
% Work slowly so that you won't run out of energy quickly.
\newcommand*{\vubth@feslowandsteady}%
  {slow and steady wins the race}
% People who don't talk a lot sometimes
% have really interesting thoughts.
\newcommand*{\vubth@festillwaters}%
  {still waters run deep}
% When you have a good opportunity, go for it.
% Don't wait for too long.
\newcommand*{\vubth@festrikewhiletheiron}%
  {strike while the iron is hot}
% Children are very similar to their parents.
\newcommand*{\vubth@fetheapple}%
  {the apple doesn't fall far from the tree}
% What you want or intend to do doesn't matter.
% Your actions matter.
% Simply wanting to do the right thing isn't enough;
% you have to actually do the right thing.
\newcommand*{\vubth@fetheroadtohell}%
  {the road to hell is paved with good intentions}
% Men love women who can cook well.
\newcommand*{\vubth@femansheart}%
  {the best way to a man's heart is through his stomach}
% When people talk about a business,
% it's good for the business,
% even if they're saying bad things about it.
\newcommand*{\vubth@febadpublicity}%
  {there's no such thing as bad publicity}
% Wasting time is expensive, so hurry up!
\newcommand*{\vubth@fetimeismoney}%
  {time is money}
% You say this when you want to be alone with someone
% (often because you are romantically interested in them)
% but someone else is also with you.
% In other words, you want the third person to go away.
\newcommand*{\vubth@fetwoiscompany}%
  {two is company, three is a crowd}
% If you do bad things to other people,
% bad things will happen to you.
% On the other hand, good things will happen to you
% if you do good things to other people.
\newcommand*{\vubth@fewhatgoesaround}%
  {what goes around comes around}
% Nothing can continue to increase forever.
% Everything that grows or rises will shrink or fall eventually.
\newcommand*{\vubth@fewhatgoesup}%
  {what goes up must come down}
% A goose is a type of bird.
% A gander is the male version of that bird.
% So this phrase means that things which are good for women
% are also good for men, and vice versa.
\newcommand*{\vubth@fewhatsgoodforthegoose}%
  {what's good for the goose is good for the gander}
% To get what you want, be nice to people.
% Don't yell at them or be mean.
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\newcommand*{\vubth@fecatchmoreflies}%
  {you can catch more flies with honey than with vinegar}
% This means that you can't have everything you want.
% There are trade-offs in life.
% You may also hear people say that you can have
% your cake and eat it too.
\newcommand*{\vubth@fehaveyourcake}%
  {you can't have your cake and eat it too}
% Older people don't change their habits easily.
\newcommand*{\vubth@feteacholddog}%
  {you can't teach an old dog new tricks}
% Your actions have consequences.
% When you do good things, good things happen to you.
% When you do bad things, bad things happen to you.
\newcommand*{\vubth@feyoureap}%
  {you reap what you sow}
% Also known as
\newcommand*{\vubth@fealsoknownas}%
  {also known as}

% Abbreviated English Phrases
\newcommand*{\vubth@aealsoknownas}%
  {a.k.a.}

% Latin Phrases User Interface
% Lowercase
\newcommand*{\idest}%
  {\vubth@latinphrase{idest}}
\newcommand*{\interalia}%
  {\vubth@latinphrase{interalia}}
\newcommand*{\exempligratia}%
  {\vubth@latinphrase{exempligratia}}
\newcommand*{\etcetera}%
  {\vubth@latinphrase{etcetera}}
\newcommand*{\videlicet}%
  {\vubth@latinphrase{videlicet}}
\newcommand*{\confer}%
  {\vubth@latinphrase{confer}}
\newcommand*{\etalii}%
  {\vubth@latinphrase{etalii}}
\newcommand*{\etaliae}%
  {\vubth@latinphrase{etaliae}}
\newcommand*{\etalia}%
  {\vubth@latinphrase{etalia}}
\newcommand*{\siceratscriptum}%
  {\vubth@latinphrase{siceratscriptum}}
\newcommand*{\idemdito}%
  {\vubth@latinphrase{idemdito}}
\newcommand*{\idemquod}%
  {\vubth@latinphrase{idemquod}}
\newcommand*{\instantemense}%
  {\vubth@latinphrase{instantemense}}
\newcommand*{\videinfra}%
  {\vubth@latinphrase{videinfra}}
\newcommand*{\videsupra}%
  {\vubth@latinphrase{videsupra}}
\newcommand*{\stantepede}%
  {\vubth@latinphrase{stantepede}}
\newcommand*{\quoderatdemonstrandum}%
  {\vubth@latinphrase{quoderatdemonstrandum}}
\newcommand*{\quodlicetiovi}%
  {\vubth@latinphrase{quodlicetiovi}}
\newcommand*{\nilvolentibusarduum}%
  {\vubth@latinphrase{nilvolentibusarduum}}
\newcommand*{\requiescatinpace}%
  {\vubth@latinphrase{requiescatinpace}}
\newcommand*{\sic}%
  {\vubth@latinphrase{sic}}
\newcommand*{\sicinfit}%
  {\vubth@latinphrase{sicinfit}}
\newcommand*{\sinequanon}%
  {\vubth@latinphrase{sinequanon}}
\newcommand*{\condiciosinequanon}%
  {\vubth@latinphrase{condiciosinequanon}}
\newcommand*{\antemeridiem}%
  {\vubth@latinphrase{antemeridiem}}
\newcommand*{\postmeridiem}%
  {\vubth@latinphrase{postmeridiem}}
\newcommand*{\scientiavincereretenebras}%
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    {\vubth@latinphrase{scientiavinceretenebras}}
  \let\vubmotto\scientiavinceretenebras
  \let\vubcredo\scientiavinceretenebras
  \let\vubcreed\scientiavinceretenebras
  \newcommand*{\solalinguabona}%
    {\vubth@latinphrase{solalinguabona}}
  \newcommand*{\aposteriori}%
    {\vubth@latinphrase{aposteriori}}
  \newcommand*{\apriori}%
    {\vubth@latinphrase{apriori}}
  \newcommand*{\sedessapientiae}%
    {\vubth@latinphrase{sedessapientiae}}
  \newcommand*{\palmanonsinepulvere}%
    {\vubth@latinphrase{palmanonsinepulvere}}
  \newcommand*{\palmamquimeruitferat}%
    {\vubth@latinphrase{palmamquimeruitferat}}
  \newcommand*{\pactasuntservanda}%
    {\vubth@latinphrase{pactasuntservanda}}
  \newcommand*{\paceminterris}%
    {\vubth@latinphrase{paceminterris}}
  \newcommand*{\almamater}%
    {\vubth@latinphrase{almamater}}
  % Changed from \invacuo to \invac to avoid a name
  % clash with \invacuo from the package `chemmacros'.
  \newcommand*{\invac}%
    {\vubth@latinphrase{invac}}
  \newcommand*{\plusultra}%
    {\vubth@latinphrase{plusultra}}
  \newcommand*{\neplusultra}%
    {\vubth@latinphrase{neplusultra}}
  \newcommand*{\necplusultra}%
    {\vubth@latinphrase{necplusultra}}
  \newcommand*{\nonplusultra}%
    {\vubth@latinphrase{nonplusultra}}
  \newcommand*{\oraetlabora}%
    {\vubth@latinphrase{oraetlabora}}
  \newcommand*{\personanongrata}%
    {\vubth@latinphrase{personanongrata}}
  \newcommand*{\personagrata}%
    {\vubth@latinphrase{personagrata}}
  \newcommand*{\perpetuummobile}%
    {\vubth@latinphrase{perpetuummobile}}
  \newcommand*{\periculuminmora}%
    {\vubth@latinphrase{periculuminmora}}
  \newcommand*{\probonopublico}%
    {\vubth@latinphrase{probonopublico}}
  \newcommand*{\senatuspopulusqueromanus}%
    {\vubth@latinphrase{senatuspopulusqueromanus}}
  \newcommand*{\voxpopuli}%
    {\vubth@latinphrase{voxpopuli}}
  \newcommand*{\ibidem}%
    {\vubth@latinphrase{ibidem}}
  \newcommand*{\perquod}%
    {\vubth@latinphrase{perquod}}
  \newcommand*{\perse}%
    {\vubth@latinphrase{perse}}
  \newcommand*{\maluminse}%
    {\vubth@latinphrase{maluminse}}
  \newcommand*{\malumprohibitum}%
    {\vubth@latinphrase{malumprohibitum}}
  \newcommand*{\notabene}%
    {\vubth@latinphrase{notabene}}
  \newcommand*{\sicvitaest}%
    {\vubth@latinphrase{sicvitaest}}
  \newcommand*{\signetur}%
    {\vubth@latinphrase{signetur}}
  \newcommand*{\versus}%
    {\vubth@latinphrase{versus}}
  \newcommand*{\quidproquo}%
    {\vubth@latinphrase{quidproquo}}
  \newcommand*{\sicsempererat}%
    {\vubth@latinphrase{sicsempererat}}
  \newcommand*{\sictransitgloria}%
    {\vubth@latinphrase{sictransitgloria}}
  \newcommand*{\sicuteretuo}%
    {\vubth@latinphrase{sicuteretuo}}
  \newcommand*{\silentiumestaureum}%
    {\vubth@latinphrase{silentiumestaureum}}
  \newcommand*{\perprocura}%
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    {\vubth@latinphrase{perprocura}}
\newcommand*{\acontrario}%
    {\vubth@latinphrase{acontrario}}
\newcommand*{\adhonorem}%
    {\vubth@latinphrase{adhonorem}}
\newcommand*{\adinfinitum}%
    {\vubth@latinphrase{adinfinitum}}
\newcommand*{\adinterim}%
    {\vubth@latinphrase{adinterim}}
\newcommand*{\corruptusinextremis}%
    {\vubth@latinphrase{corruptusinextremis}}
\newcommand*{\adlibitum}%
    {\vubth@latinphrase{adlibitum}}
\newcommand*{\paripassu}%
    {\vubth@latinphrase{paripassu}}
\newcommand*{\percaput}%
    {\vubth@latinphrase{percaput}}
\newcommand*{\percapita}%
    {\vubth@latinphrase{percapita}}
\newcommand*{\perannum}%
    {\vubth@latinphrase{perannum}}
\newcommand*{\resnonverba}%
    {\vubth@latinphrase{resnonverba}}
\newcommand*{\respublica}%
    {\vubth@latinphrase{respublica}}
\newcommand*{\respiceadspiceprospice}%
    {\vubth@latinphrase{respiceadspiceprospice}}
\newcommand*{\venividivici}%
    {\vubth@latinphrase{venividivici}}
\newcommand*{\verbigratia}%
    {\vubth@latinphrase{verbigratia}}
\newcommand*{\veritasvosliberabit}%
    {\vubth@latinphrase{veritasvosliberabit}}
\newcommand*{\semperfidelis}%
    {\vubth@latinphrase{semperfidelis}}
\newcommand*{\percontra}%
    {\vubth@latinphrase{percontra}}
\newcommand*{\corruptiooptimipessima}%
    {\vubth@latinphrase{corruptiooptimipessima}}
\newcommand*{\degustibus}%
    {\vubth@latinphrase{degustibus}}

% Uppercase First Letter
\newcommand*{\Idest}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {idest}}
\newcommand*{\Interalia}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {interalia}}
\newcommand*{\Exempligratia}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {exempligratia}}
\newcommand*{\Etcetera}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {etcetera}}
\newcommand*{\Videlicet}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {videlicet}}
\newcommand*{\Confer}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {confer}}
\newcommand*{\Etalii}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {etalii}}
\newcommand*{\Etaliae}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {etaliae}}
\newcommand*{\Etalia}%
    {\vubth@latinphrase%
       [\emakefirstuc]%
       {etalia}}
```

```
\newcommand*{\Siceratscriptum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {siceratscriptum}}
\newcommand*{\Idemdito}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {idemdito}}
\newcommand*{\Idemquod}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {idemquod}}
\newcommand*{\Instantemense}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {instantemense}}
\newcommand*{\Videinfra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {videinfra}}
\newcommand*{\Videsupra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {videsupra}}
\newcommand*{\Stantepede}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {stantepede}}
\newcommand*{\Quoderatdemonstrandum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {quoderatdemonstrandum}}
\newcommand*{\Quodlicetiovi}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {quodlicetiovi}}
\newcommand*{\Nilvolentibusarduum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {nilvolentibusarduum}}
\newcommand*{\Requiescatinpace}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {requiescatinpace}}
\newcommand*{\Sic}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sic}}
\newcommand*{\Sicinfit}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sicinfit}}
\newcommand*{\Sinequanon}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sinequanon}}
\newcommand*{\Condiciosinequanon}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {condiciosinequanon}}
\newcommand*{\Antemeridiem}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {antemeridiem}}
\newcommand*{\Postmeridiem}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {postmeridiem}}
\newcommand*{\Scientiavincereretenebras}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {scientiavincereretenebras}}
\let\Vubmotto\Scientiavincereretenebras
\let\Vubcredo\Scientiavincereretenebras
\let\Vubcreed\Scientiavincereretenebras
\newcommand*{\Solalinguabona}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {solalinguabona}}
```

```
\newcommand*{\Aposteriori}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {aposteriori}}
\newcommand*{\Apriori}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {apriori}}
\newcommand*{\Sedessapientiae}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sedessapientiae}}
\newcommand*{\Palmanonsinepulvere}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {palmanonsinepulvere}}
\newcommand*{\Palmamquimeruitferat}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {palmamquimeruitferat}}
\newcommand*{\Pactasuntservanda}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {pactasuntservanda}}
\newcommand*{\Paceminterris}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {paceminterris}}
\newcommand*{\Almamater}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {almamater}}
\newcommand*{\Invac}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {invac}}
\newcommand*{\Plusultra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {plusultra}}
\newcommand*{\Neplusultra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {neplusultra}}
\newcommand*{\Necplusultra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {necplusultra}}
\newcommand*{\Nonplusultra}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {nonplusultra}}
\newcommand*{\Oraetlabora}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {oraetlabora}}
\newcommand*{\Personanongrata}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {personanongrata}}
\newcommand*{\Personagrata}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {personagrata}}
\newcommand*{\Perpetuummobile}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {perpetuummobile}}
\newcommand*{\Periculuminmora}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {periculuminmora}}
\newcommand*{\Probonopublico}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {probonopublico}}
\newcommand*{\Senatuspopulusqueromanus}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
```

```
    {senatuspopulusqueromanus}}
\newcommand*{\Voxpopuli}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {voxpopuli}}
\newcommand*{\Ibidem}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {ibidem}}
\newcommand*{\Perquod}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {perquod}}
\newcommand*{\Perse}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {perse}}
\newcommand*{\Maluminse}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {maluminse}}
\newcommand*{\Malumprohibitum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {malumprohibitum}}
\newcommand*{\Notabene}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {notabene}}
\newcommand*{\Sicvitaest}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sicvitaest}}
\newcommand*{\Signetur}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {signetur}}
\newcommand*{\Versus}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {versus}}
\newcommand*{\Quidproquo}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {quidproquo}}
\newcommand*{\Sicsempererat}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sicsempererat}}
\newcommand*{\Sictransitgloria}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sictransitgloria}}
\newcommand*{\Sicuteretuo}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {sicuteretuo}}
\newcommand*{\Silentiumestaureum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {silentiumestaureum}}
\newcommand*{\Perprocura}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {perprocura}}
\newcommand*{\Acontrario}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {acontrario}}
\newcommand*{\Adhonorem}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {adhonorem}}
\newcommand*{\Adinfinitum}%
  {\vubth@latinphrase%
     [\emakefirstuc]%
     {adinfinitum}}
\newcommand*{\Adinterim}%
  {\vubth@latinphrase%
```

```
      [\emakefirstuc]%
      {adinterim}}
\newcommand*{\Corruptusinextremis}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {corruptusinextremis}}
\newcommand*{\Adlibitum}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {adlibitum}}
\newcommand*{\Paripassu}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {paripassu}}
\newcommand*{\Percaput}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {percaput}}
\newcommand*{\Percapita}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {percapita}}
\newcommand*{\Perannum}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {perannum}}
\newcommand*{\Resnonverba}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {resnonverba}}
\newcommand*{\Respublica}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {respublica}}
\newcommand*{\Respiceadspiceprospice}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {respiceadspiceprospice}}
\newcommand*{\Venividivici}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {venividivici}}
\newcommand*{\Verbigratia}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {verbigratia}}
\newcommand*{\Veritasvosliberabit}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {veritasvosliberabit}}
\newcommand*{\Semperfidelis}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {semperfidelis}}
\newcommand*{\Percontra}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {percontra}}
\newcommand*{\Corruptiooptimipessima}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {corruptiooptimipessima}}
\newcommand*{\Degustibus}%
  {\vubth@latinphrase%
      [\emakefirstuc]%
      {degustibus}}

% Camel Casing (Pascal Casing)
% These macros are only useful when the toggle
% `abbrevlatin' is false. Otherwise they are a
% synonym for the Uppercase macros.
\newcommand*{\IdEst}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {idest}}
\newcommand*{\InterAlia}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {interalia}}
```

```
\newcommand*{\ExempliGratia}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {exempligratia}}
\newcommand*{\EtCetera}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {etcetera}}
\newcommand*{\EtAlii}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {etalii}}
\newcommand*{\EtAliae}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {etaliae}}
\newcommand*{\EtAlia}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {etalia}}
\newcommand*{\SicEratScriptum}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {siceratscriptum}}
\newcommand*{\IdemDito}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {idemdito}}
\newcommand*{\IdemQuod}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {idemquod}}
\newcommand*{\InstanteMense}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {instantemense}}
\newcommand*{\VideInfra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {videinfra}}
\newcommand*{\VideSupra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {videsupra}}
\newcommand*{\StantePede}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {stantepede}}
\newcommand*{\QuodEratDemonstrandum}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {quoderatdemonstrandum}}
\newcommand*{\QuodLicetIovi}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {quodlicetiovi}}
\newcommand*{\NilVolentibusArduum}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {nilvolentibusarduum}}
\newcommand*{\RequiescatInPace}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {requiescatinpace}}
\newcommand*{\SicInfit}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sicinfit}}
\newcommand*{\SineQuaNon}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sinequanon}}
\newcommand*{\CondicioSineQuaNon}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {condiciosinequanon}}
\newcommand*{\AnteMeridiem}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
```

```
      {antemeridiem}}
\newcommand*{\PostMeridiem}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {postmeridiem}}
\newcommand*{\ScientiaVincereTenebras}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {scientiavincereteneb ras}}
\let\VubMotto\ScientiaVincereTenebras
\let\VubCredo\ScientiaVincereTenebras
\let\VubCreed\ScientiaVincereTenebras
\newcommand*{\SolaLinguaBona}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {solalinguabona}}
\newcommand*{\APosteriori}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {aposteriori}}
\newcommand*{\APriori}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {apriori}}
\newcommand*{\SedesSapientiae}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sedessapientiae}}
\newcommand*{\PalmaNonSinePulvere}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {palmanonsinepulvere}}
\newcommand*{\PalmamQuiMeruitFerat}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {palmamquimeruitferat}}
\newcommand*{\PactaSuntServanda}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {pactasuntservanda}}
\newcommand*{\PacemInTerris}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {paceminterris}}
\newcommand*{\AlmaMater}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {almamater}}
\newcommand*{\InVac}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {invac}}
\newcommand*{\PlusUltra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {plusultra}}
\newcommand*{\NePlusUltra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {neplusultra}}
\newcommand*{\NecPlusUltra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {necplusultra}}
\newcommand*{\NonPlusUltra}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {nonplusultra}}
\newcommand*{\OraEtLabora}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {oraetlabora}}
\newcommand*{\PersonaNonGrata}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {personanongrata}}
\newcommand*{\PersonaGrata}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
```

```
    {personagrata}}
\newcommand*{\PerpetuumMobile}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {perpetuummobile}}
\newcommand*{\PericulumInMora}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {periculuminmora}}
\newcommand*{\ProBonoPublico}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {probonopublico}}
\newcommand*{\SenatusPopulusqueRomanus}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {senatuspopulusqueromanus}}
\newcommand*{\VoxPopuli}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {voxpopuli}}
\newcommand*{\PerQuod}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {perquod}}
\newcommand*{\PerSe}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {perse}}
\newcommand*{\MalumInSe}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {maluminse}}
\newcommand*{\MalumProhibitum}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {malumprohibitum}}
\newcommand*{\NotaBene}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {notabene}}
\newcommand*{\SicVitaEst}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sicvitaest}}
\newcommand*{\QuidProQuo}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {quidproquo}}
\newcommand*{\SicSemperErat}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sicsempererat}}
\newcommand*{\SicTransitGloria}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sictransitgloria}}
\newcommand*{\SicUtereTuo}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {sicuteretuo}}
\newcommand*{\SilentiumEstAureum}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {silentiumestaureum}}
\newcommand*{\PerProcura}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {perprocura}}
\newcommand*{\AContrario}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {acontrario}}
\newcommand*{\AdHonorem}%
  {\vubth@latinphrase%
     [\ecapitalisewords]%
     {adhonorem}}
\newcommand*{\AdInfinitum}%
  {\vubth@latinphrase%
```

```
      [\ecapitalisewords]%
      {adinfinitum}}
\newcommand*{\AdInterim}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {adinterim}}
\newcommand*{\CorruptusInExtremis}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {corruptusinextremis}}
\newcommand*{\AdLibitum}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {adlibitum}}
\newcommand*{\PariPassu}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {paripassu}}
\newcommand*{\PerCaput}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {percaput}}
\newcommand*{\PerCapita}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {percapita}}
\newcommand*{\PerAnnum}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {perannum}}
\newcommand*{\ResNonVerba}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {resnonverba}}
\newcommand*{\ResPublica}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {respublica}}
\newcommand*{\RespiceAdspiceProspice}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {respiceadspiceprospice}}
\newcommand*{\VeniVidiVici}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {venividivici}}
\newcommand*{\VerbiGratia}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {verbigratia}}
\newcommand*{\VeritasVosLiberabit}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {veritasvosliberabit}}
\newcommand*{\SemperFidelis}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {semperfidelis}}
\newcommand*{\PerContra}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {percontra}}
\newcommand*{\CorruptioOptimiPessima}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {corruptiooptimipessima}}
\newcommand*{\DeGustibus}%
  {\vubth@latinphrase%
      [\ecapitalisewords]%
      {degustibus}}

% Full Latin Phrases
% That is
\newcommand*{\vubth@flidest}%
  {id est}
% Among other things
\newcommand*{\vubth@flinteralia}%
  {inter alia}
% For the sake of example, literally "free example"
```

```
  \newcommand*{\vubth@flexempligratia}%
    {exempli gratia}
% ""And the rest"", "And so on" or "and more"
  \newcommand*{\vubth@fletcetera}%
    {et cetera}
% "Namely", "that is to say" or "as follows"
  \newcommand*{\vubth@flvidelicet}%
    {videlicet}
% Compare
  \newcommand*{\vubth@flconfer}%
    {confer}
% Alii is masculine, so it can be used for men,
% or groups of men and women
  \newcommand*{\vubth@fletalii}%
    {et alii}
% The feminine, et aliae (or et aliæ), is appropriate
% the "others" are all female; but as with many loanwords,
% interlingual use (such as in reference lists) is often invariable
  \newcommand*{\vubth@fletaliae}%
    {et aliae}
% Et alia is neuter plural and thus in Latin text is properly
% used only for inanimate, genderless objects, but some
% use it as a gender-neutral alternative
  \newcommand*{\vubth@fletalia}%
    {et alia}
% "Thus was it written"
  \newcommand*{\vubth@flsiceratscriptum}%
    {sic erat scriptum}
% "The same"
% Used to refer to something that has already been cited.
  \newcommand*{\vubth@flidemdito}%
    {idem dito}
% "The same as"
  \newcommand*{\vubth@flidemquod}%
    {idem quod}
% "In the present month"
  \newcommand*{\vubth@flinstantemense}%
    {instante mense}
% "See below"
  \newcommand*{\vubth@flvideinfra}%
    {vide infra}
% "see above"
  \newcommand*{\vubth@flvidesupra}%
    {vide supra}
% With a standing foot, "Immediately"
  \newcommand*{\vubth@flstantepede}%
    {stante pede}
% what was to be demonstrated.
% The abbreviation is often written at the bottom of
% a mathematical proof.
  \newcommand*{\vubth@flquoderatdemonstrandum}%
    {quod erat demonstrandum}
% What is permitted to Jupiter is not permitted to an ox.
% If an important person does something,
% it does not necessarily mean that everyone can do it
% (cf. double standard).
% Iovi (also commonly rendered Jovi)
% is the dative form of Iuppiter ("Jupiter" or "Jove"),
% the chief god of the Romans.
  \newcommand*{\vubth@flquodlicetiovi}%
    {quod licet Iovi, non licet bovi}
% Nothing [is] arduous for the willing
% Nothing is impossible for the willing
  \newcommand*{\vubth@flnilvolentibusarduum}%
    {nil volentibus arduum}
% Let him rest in peace or "may he rest in peace".
% A benediction for the dead.
% Often inscribed on tombstones or other grave markers.
% "RIP" is commonly mistranslated as "Rest In Peace",
% though the two mean essentially the same thing.
  \newcommand*{\vubth@flrequiescatinpace}%
    {requiescat in pace}
% Thus or "just so".
% States that the preceding quoted material appears exactly
% that way in the source, despite any errors of spelling,
% grammar, usage, or fact that may be present.
% Used only for previous quoted text;
% ita or similar must be used to mean "thus" when referring
% to something about to be stated.
```

```
  \newcommand*{\vubth@flsic}%
    {sic}
  % So it begins.
  \newcommand*{\vubth@flsicinfit}%
    {sic infit}
  % Without which not.
  % Used to denote something that is an essential part
  % of the whole. See also condicio sine qua non.
  \newcommand*{\vubth@flsinequanon}%
    {sine qua non}
  % Condition without which not.
  % A required, indispensable condition.
  % Commonly mistakenly rendered with
  % conditio ("seasoning" or "preserving")
  % in place of
  % condicio ("arrangement" or "condition").
  \newcommand*{\vubth@flcondiciosinequanon}%
    {condicio \vubth@flsinequanon}
  % Before midday
  % From midnight to noon (cf. post meridiem).
  \newcommand*{\vubth@flantemeridiem}%
    {ante meridiem}
  % After midday.
  % The period from noon to midnight (cf. ante meridiem).
  \newcommand*{\vubth@flpostmeridiem}%
    {post meridiem}
  % Conquering darkness by science.
  % Motto of several institutions, such as the
  % Free University of Brussels (Vrije Universiteit Brussel).
  \newcommand*{\vubth@flscientiavincereretenebras}%
    {scientia vincere tenebras}
  % The only good language is a dead language.
  % Example of dog Latin humor.
  \newcommand*{\vubth@flsolalinguabona}%
    {sola lingua bona est lingua mortua}
  % From the latter.
  % Based on observation (i.e., empirical evidence),
  % the reverse of a priori. Used in mathematics and logic to denote
  % something that is known after a proof has been carried out.
  % In philosophy, used to denote something known from experience.
  \newcommand*{\vubth@flaposteriori}%
    {a posteriori}
  % From the former.
  % Presupposed independent of experience,
  % the reverse of a posteriori.
  % Used in mathematics and logic to denote something that is
  % known or postulated before a proof has been carried out.
  % In philosophy, used to denote something is supposed without
  % empirical evidence.
  % In everyday speech, it denotes something occurring
  % or being known before the event.
  \newcommand*{\vubth@flapriori}%
    {a priori}
  % "Seat of Wisdom" (Knowledge)
  \newcommand*{\vubth@flsedessapientiae}%
    {sedes sapientiae}
  % No reward without effort
  % Also "dare to try"; motto of numerous schools.
  \newcommand*{\vubth@flpalmanonsinepulvere}%
    {palma non sine pulvere}
  % He who has earned the palm, let him bear it.
  % Loosely, "achievement should be rewarded"
  % (or, "let the symbol of victory go to him who has deserved it").
  % Attached to the arms of Lord Nelson in 1797.
  % Later attached to the arms of Upper Canada College and its motto.
  % Also motto of the University of Southern California, Nelson, NZ,
  % the Lincoln Academy of Illinois & Bay View High School, Milwaukee, WI.
  \newcommand*{\vubth@flpalmamquimeruitferat}%
    {palmam qui meruit ferat}
  % Agreements must be kept.
  % Also "contracts must be honoured".
  % Indicates the binding power of treaties.
  \newcommand*{\vubth@flpactasuntservanda}%
    {pacta sunt servanda}
  % Peace on Earth.
  \newcommand*{\vubth@flpaceminterris}%
    {pacem in terris}
  % Nourishing mother.
  % Term used for the university one attends or has attended.
```

```
% Another university term, matriculation,
% is also derived from mater.
% The term suggests that the students are "fed" knowledge
% and taken care of by the university.
% The term is also used for a university's traditional
% school anthem.
\newcommand*{\vubth@flalmamater}%
  {alma mater}
% in a void
% In a vacuum;
% isolated from other things.
\newcommand*{\vubth@flinvac}%
  {in vacuo}
% Nothing more beyond.
% A descriptive phrase meaning the best or most extreme
% example of something.
% The Pillars of Hercules, for example,
% were literally the nec plus ultra of the ancient
% Mediterranean world.
% Holy Roman Emperor Charles V's heraldic emblem
% reversed this idea, using a depiction of this phrase
% inscribed on the Pillars—as plus ultra,
% without the negation.
% The Boston Musical Instrument Company
% engraved ne plus ultra on its instruments
% from 1869 to 1928 to signify that none were better.
\newcommand*{\vubth@flplusultra}%
  {plus ultra}
\newcommand*{\vubth@flneplusultra}%
  {ne \vubth@flplusultra}
% Variant of "ne plus ultra".
\newcommand*{\vubth@flnecplusultra}%
  {nec \vubth@flplusultra}
% Variant of "ne plus ultra".
\newcommand*{\vubth@flnonplusultra}%
  {non \vubth@flplusultra}
% Pray and work.
% This principle of the Benedictine monasteries
% reads in full:
% "Ora et labora (et lege), Deus adest sine mora."
% "Pray and work (and read), God is there without delay"
% (or to keep the rhyme:
% "Work and pray, and God is there without delay")
\newcommand*{\vubth@floraetlabora}%
  {ora et labora}
% Person not pleasing.
% An unwelcome, unwanted or undesirable person.
% In diplomatic contexts, a person rejected by
% the host government.
% The reverse, persona grata ("pleasing person"),
% is less common, and refers to a diplomat acceptable
% to the government of the country to which he is sent.
\newcommand*{\vubth@flpersonanongrata}%
  {persona non grata}
\newcommand*{\vubth@flpersonagrata}%
  {persona grata}
% Thing in perpetual motion.
% A musical term. Also used to refer to
% hypothetical perpetual motion machines.
\newcommand*{\vubth@flperpetuummobile}%
  {perpetuum mobile}
% Danger in delay.
\newcommand*{\vubth@flpericuluminmora}%
  {periculum in mora}
% For the public good.
% Often abbreviated pro bono.
% Work undertaken voluntarily at no expense,
% such as public services.
% Often used of a lawyer's work that is not charged for.
\newcommand*{\vubth@flprobonopublico}%
  {pro bono publico}
% The Senate and the People of Rome.
% The official name of the Roman Republic.
% "SPQR" was carried on battle standards by the Roman legions.
% In addition to being an ancient Roman motto,
% it remains the motto of the modern city of Rome.
\newcommand*{\vubth@flsenatuspopulusqueromanus}%
  {senatus populusque romanus}
% Voice of the people.
```

```
% Short non-prearranged interview with an
% ordinary person (e.g. on the street).
\newcommand*{\vubth@flvoxpopuli}%
  {vox populi}
% In the same place.
% Usually used in bibliographic citations to refer to
% the last source previously referenced.
\newcommand*{\vubth@flibidem}%
  {ibidem}
% By reason of which.
% In a UK legal context: "by reason of which"
% (as opposed to per se which requires no reasoning).
% In American jurisprudence often refers to
% a spouse's claim for loss of consortium.
\newcommand*{\vubth@flperquod}%
  {per quod}
% Through itself.
% Also "by itself" or "in itself".
% Without referring to anything else, intrinsically,
% taken without qualifications etc.
% A common example is negligence per se.
% See also malum in se.
\newcommand*{\vubth@flperse}%
  {per se}
% Wrong in itself.
% A legal term meaning that something is inherently wrong
% (cf. malum prohibitum).
\newcommand*{\vubth@flmaluminse}%
  {malum in se}
% Wrong due to being prohibited.
% A legal term meaning that something is only wrong
% because it is against the law.
\newcommand*{\vubth@flmalumprohibitum}%
  {malum prohibitum}
% Mark well.
% That is, "please note" or "note it well".
\newcommand*{\vubth@flnotabene}%
  {nota bene}
% Thus is life or "such is life".
% Indicates that a circumstance, whether good or bad,
% is an inherent aspect of living.
\newcommand*{\vubth@flsicvitaest}%
  {sic vita est}
% Let it be labeled.
% Medical shorthand.
\newcommand*{\vubth@flsignetur}%
  {signetur}
% Towards.
% Literally "in the direction".
% Mistakenly used in English as "against"
% (probably from "adversus"),
% particularly to denote two opposing parties,
% such as in a legal dispute or a sports match.
\newcommand*{\vubth@flversus}%
  {versus}
% what for what Commonly used in English,
% it is also translated as "this for that" or "a thing for a thing".
% Signifies a favor exchanged for a favor.
% The traditional Latin expression for this meaning was do ut des
% ("I give, so that you may give").
\newcommand*{\vubth@flquidproquo}%
  {quid pro quo}
% Thus has it always been, and thus shall it ever be.
\newcommand*{\vubth@flsicsempererat}%
  {sic semper erat, et sic semper erit}
% Thus passes the glory of the world.
% A reminder that all things are fleeting.
% During Papal Coronations, a monk reminds the Pope
% of his mortality by saying this phrase, preceded by
% pater sancte ("holy father") while holding
% before his eyes a burning paper
% illustrating the passing nature of earthly glories.
% This is similar to the tradition of a slave
% in a Roman triumphs whispering memento mori
% in the ear of the celebrant.
\newcommand*{\vubth@flsictransitgloria}%
  {sic transit gloria mundi}
% Use [what is] yours so as not to harm [what is] of others.
% Use your property in such a way that you do not damage others.
```

```
% A legal maxim related to property ownership laws,
% often shortened to simply sic utere ("use it thus").
\newcommand*{\vubth@flsicuteretuo}%
  {sic utere tuo ut alienum non laedas}
% Silence is golden.
% Latinization of the English expression "silence is golden".
% Also Latinized as silentium est aurum ("silence is gold").
\newcommand*{\vubth@flsilentiumestaureum}%
  {silentium est aureum}
% Through the agency.
% Also rendered per procurationem.
% Used to indicate that a person is signing a document
% on behalf of another person.
% Correctly placed before the name of the person signing,
% but often placed before the name of the person
% on whose behalf the document is signed,
% sometimes through incorrect translation
% of the alternative abbreviation
% per pro. as "for and on behalf of".
\newcommand*{\vubth@flperprocura}%
  {per procura}
% From the opposite.
% Equivalent to "on the contrary" or "au contraire".
% An argumentum a contrario is an "argument from the contrary",
% an argument or proof by contrast or direct opposite.
\newcommand*{\vubth@flacontrario}%
  {a contrario}
% To the honour.
% Generally means "for the honour",
% not seeking any material reward.
\newcommand*{\vubth@fladhonorem}%
  {ad honorem}
% To infinity.
% Going on forever.
% Used to designate a property which repeats
% in all cases in mathematical proof.
\newcommand*{\vubth@fladinfinitum}%
  {ad infinitum}
% For the meantime.
% As in the term "chargé d'affaires ad interim"
% for a diplomatic officer who acts in place of
% an ambassador.
\newcommand*{\vubth@fladinterim}%
  {ad interim}
% Toward pleasure.
% Loosely, "according to what pleases" or "as you wish";
% libitum comes from the past participle of libere, "to please".
% It typically indicates in music and theatrical scripts
% that the performer has the liberty to change or omit something.
% Ad lib is specifically often used when someone improvises
% or ignores limitations.
% Also used by some restaurants in favor of the colloquial
% "all you can eat or drink".
\newcommand*{\vubth@fladlibitum}%
  {ad libitum}
% Extremely corrupt.
\newcommand*{\vubth@flcorruptusinextremis}%
  {corruptus in extremis}
% With equal step.
% Thus, "moving together", "simultaneously", etc.
\newcommand*{\vubth@flparipassu}%
  {pari passu}
% By heads.
% "Per head", i.e., "per person",
% a ratio by the number of persons.
% The singular is per caput.
\newcommand*{\vubth@flpercaput}%
  {per caput}
\newcommand*{\vubth@flpercapita}%
  {per capita}
% Each year.
% Thus, "yearly"—occurring every year.
\newcommand*{\vubth@flperannum}%
  {per annum}
% "actions speak louder than words", or "deeds, not words".
% From rēs ("things, facts") the plural of rēs
% ("a thing, a fact") + nōn ("not") + verba ("words")
% the plural of verbum ("a word").
% Literally meaning "things, not words" or
```

```
% "facts instead of words" but referring to that
% "actions be used instead of words".
\newcommand*{\vubth@flresnonverba}%
  {res, non verba}
% Pertaining to the state or public source of the word republic.
\newcommand*{\vubth@flrespublica}%
  {res publica}
% Look behind, look here, look ahead i.e.,
% "examine the past, the present and future".
% Motto of CCNY.
\newcommand*{\vubth@flrespiceadspiceprospice}%
  {respice adspice prospice}
% I came, I saw, I conquered.
% The message supposedly sent by Julius Caesar
% to the Roman Senate to describe his battle
% against King Pharnaces II near Zela in 47 BC.
\newcommand*{\vubth@flvenividivici}%
  {veni, vidi, vici}
% For example.
% literally: "for the sake of a word".
\newcommand*{\vubth@flverbigratia}%
  {verbi gratia}
% The truth will set you free.
% Motto of Johns Hopkins University.
\newcommand*{\vubth@flveritasvosliberabit}%
  {veritas vos liberabit}
% Always faithful.
% Motto of several institutions, e.g. United States Marine Corps.
\newcommand*{\vubth@flsemperfidelis}%
  {semper fidelis}
% Through the contrary Or "on the contrary" (cf. a contrario).
\newcommand*{\vubth@flpercontra}%
  {per contra}
% The corruption of the best is the worst.
\newcommand*{\vubth@flcorruptiooptimipessima}%
  {corruptio optimi pessima}
% When we talk about tastes and colors there is nothing
% to be disputed.
% Because they're up to a subjective point of view:
% everyone has his own and no one deserve any prominence.
% Likely of Scholastic origin.
\newcommand*{\vubth@fldegustibus}%
  {de gustibus et coloribus non est disputandum}

% Abbreviated Latin Phrases
\newcommand*{\vubth@alidest}%
  {i.e.}
\newcommand*{\vubth@alinteralia}%
  {i.a.}
\newcommand*{\vubth@alexempligratia}%
  {e.g.}
\newcommand*{\vubth@aletcetera}%
  {etc.}
\newcommand*{\vubth@alvidelicet}%
  {viz.}
\newcommand*{\vubth@alconfer}%
  {cf.}
\newcommand*{\vubth@aletalii}%
  {et al.}
\let\vubth@aletaliae\vubth@aletalii
\let\vubth@aletalia\vubth@aletalii
\newcommand*{\vubth@alsiceratscriptum}%
  {sic}
\newcommand*{\vubth@alidemdito}%
  {id.}
\newcommand*{\vubth@alidemquod}%
  {i.q.}
\newcommand*{\vubth@alinstantemense}%
  {inst.}
\newcommand*{\vubth@alvideinfra}%
  {v.i.}
\newcommand*{\vubth@alvidesupra}%
  {v.s.}
\newcommand*{\vubth@alquoderatdemonstrandum}%
  {QED}
\newcommand*{\vubth@alrequiescatinpace}%
  {RIP}
\newcommand*{\vubth@alantemeridiem}%
  {a.m.}
```

```
  \newcommand*{\vubth@alpostmeridiem}%
    {p.m.}
  \newcommand*{\vubth@alprobonopublico}%
    {pro bono}
  \newcommand*{\vubth@alsenatuspopulusqueromanus}%
    {SPQR}
  \newcommand*{\vubth@alvoxpopuli}%
    {vox pop}
  \newcommand*{\vubth@alibidem}%
    {ibid.}
  \newcommand*{\vubth@alnotabene}%
    {n.b.}
  \newcommand*{\vubth@alsignetur}%
    {sig.}% or S/
  \newcommand*{\vubth@alversus}%
    {vs.}% or v.
  \newcommand*{\vubth@alperprocura}%
    {p.p.}% or per pro
  \newcommand*{\vubth@aladinterim}%
    {ad int}
  \newcommand*{\vubth@aladlibitum}%
    {ad lib}
  \newcommand*{\vubth@alperannum}%
    {pa.}
  \newcommand*{\vubth@alverbigratia}%
    {v.g.}% or v.gr.
  % Of tastes there is nothing to be disputed.
  % Less literally "there's no accounting for taste".
  \newcommand*{\vubth@aldegustibus}%
    {de gustibus non est disputandum}

  %-----------------------------------------------------------------------
  % INPUT ACRONYMS & HYPHENATION

  \InputIfFileExists{acrohyph}%
    {\ClassInfo{vubthesis}%
       {Acronym-Hyphenation file `acrohyph' found \& loaded}}%
    {\ClassWarningNoLine{vubthesis}%
       {Acronym-Hyphenation file `acrohyph' not found}}

  \endinput
  %%
  %% End of file `vubthesis.cls'.
```

Back Matter

Notes

Chapter 2 Background & Related Work

1. (page 10) All images of products used in this Chapter are courtesy of Sony Electronics Europe, unless indicated otherwise.
2. (page 10) Figure available from:
http://photographycourse.net/wp-content/uploads/2010/08/slr.jpg
3. (page 10) Figure available from:
http://forum.lumion3d.com/general-discussion/camera-settings-human-eye/
4. (page 22) An empty antecedent is treated as trivially true, i.e. satisfied by every interpretation, so the consequent must also be satisfied by every interpretation; an empty consequent is treated as trivially false, i.e. not satisfied by any interpretation, so the antecedent must also not be satisfied by any interpretation.
5. (page 25) Thanks to prof. dr. Sebti Foufou for providing a copy of this paper.

Chapter 3 Towards The Solution

1. (page 33) Microsoft Access [Mic15a] is a database management system from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools. It is a member of the Microsoft Office suite of applications, included in the Professional and higher editions or sold separately.
2. (page 34) Visual Studio is an IDE from Microsoft. It is used to develop computer programs for Microsoft Windows, as well as web sites, web applications and web services [Mic15b].

Chapter 4 Implementation

1. (page 44) In this section we will use the term *schema* to refer to both ontologies, schemas, meta-schemas, etc.
2. (page 44) Annotations that are only used by one particular camera distributor. E.g. the annotation http://data-vocabulary.org/Product is used only by Samsung
3. (page 44) The number of degrees of freedom (df) is equal to $n - 1$. Since we found 43 distinct annotations, $\text{df} = 43 - 1 = 42$

Acronyms

A

API Application Programming Interface. 42, 58–60, 62

C

CF CompactFlash. 14, 15
CSV Comma-Separated Values. 19, 41, 47, 60

D

DRM Digital Rights Management. 14, 15

G

GOSPL Grounding Ontologies with Social Processes and Natural Language. 19
GUI Graphical User Interface. 50, 54

H

HD High Definition. 10
HIFI High Fidelity. 34
HTML Hypertext Markup Language. 30, 33, 47
HTTP Hypertext Transfer Protocol. 18, 42, 58

I

IDE Integrated Development Environment. 42, 533
ISBN International Standard Book Number. 34

J

JSON JavaScript Object Notation. 41
JVM Java Virtual Machine. 42

L

LCD Liquid Crystal Display. 10
LED Light Emitting Diode. 16

M

MMC MultiMedia Card. 14, 15
  RS-MMC Reduced Size MultiMedia Card. 14
MP3 Moving Picture Experts Group (1 or 2) Audio Layer III. 14, 15
MPN Manufacturer Part Number. 58

N

NORMA Natural ORM Architect. 34

O

OGP Open Graph Protocol. 23, 30, 44, 58
OOPS! OntOlogy Pitfall Scanner!. 426
ORM Object Role Modeling. 34, 48
OWL Web Ontology Language. 20–23, 25, 42, 47, 48, 52, 58–60, 62
  OWL DL Web Ontology Language Description Logic. 21, 59, 60

P

PDF Portable Document Format. 34
PMO Product Modelling Ontology. 25
PRONTO PRoduct ONTOlogy. 23, 25

R

R2RML RDB to RDF Mapping Language. 41
RDF Resource Description Framework. 18–21, 41, 42, 58, 59, 62
RDFA RDF in Attributes. 33
RDFS RDF Schema. 18, 21, 59
REST Representational State Transfer. 42
RFC Request for Comments. 47
RML RDF Mapping Language. 30, 41, 50
RULE ML Rule Markup Language. 21

S

SD Secure Digital. 15, 17
SKU Stock Keeping Unit. 34, 40, 58
SPARQL SPARQL Protocol and RDF Query Language. 18, 19, 42, 50, 53, 59
SPIN SPARQL Inferencing Notation. 25, 41
SWOP Semantic Web-based Open Engineering Platform. 25
SWRL Semantic Web Rule Language. 7, 21, 22, 30, 42, 44, 49, 50, 53, 54, 58, 62, 66, 85, 428

T

TDB Triplestore Database. 42, 50, 54, 58, 59
TV Television. 10

U

URI Uniform Resource Identifier. 18–20, 41, 50, 53
URL Uniform Resource Locator. 23, 26, 33

V

VUB Vrije Universiteit Brussel. 4, 434, 442

W

W3C World Wide Web Consortium. 19
WWW World Wide Web. 18

X

XD eXtreme Digital. 15
XML Extensible Markup Language. 4, 18, 21, 41, 42, 59, 60
XSPARQL XQuery SPARQL. 41

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In Memoriam Hubert Stroobants

Verdriet

Verdriet is als een boom in de winter:
verhard en zwart wijzen zijn takken
als verwijtende vingers naar de hemel
„voor mij hoeft het niet meer."

„Laat mij staan waar ik sta
het mag vriezen, het mag dooien
het mag hagelen en sneeuwen
het mag stormen en waaien
het doet me niets
het valt in het niet
bij mijn verdriet."

Zo stond de boom in het winterse land.
De storm brak hem niet
de wind deed hem niet wiegen
en de regen gleed af langs loodzware stam.
„Voor mij hoeft het niet meer. Ik ben er niet."

Maar onder het zwart van die sombere bast
daar gonsde en gistte het
krioelde en kriebelde het
daar klopte en bloedde het
de winter lang.
Hij boog niet maar barstte
barstte uit
in duizend knoppen
of hij wilde of niet.

Yvonne van Emmerik [vEmm06, p. 63]
Herdrukt met toestemming van
Uitgeverij Ten Have

Requiescat in Pace,
Hubert Stroobants

Colophon

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