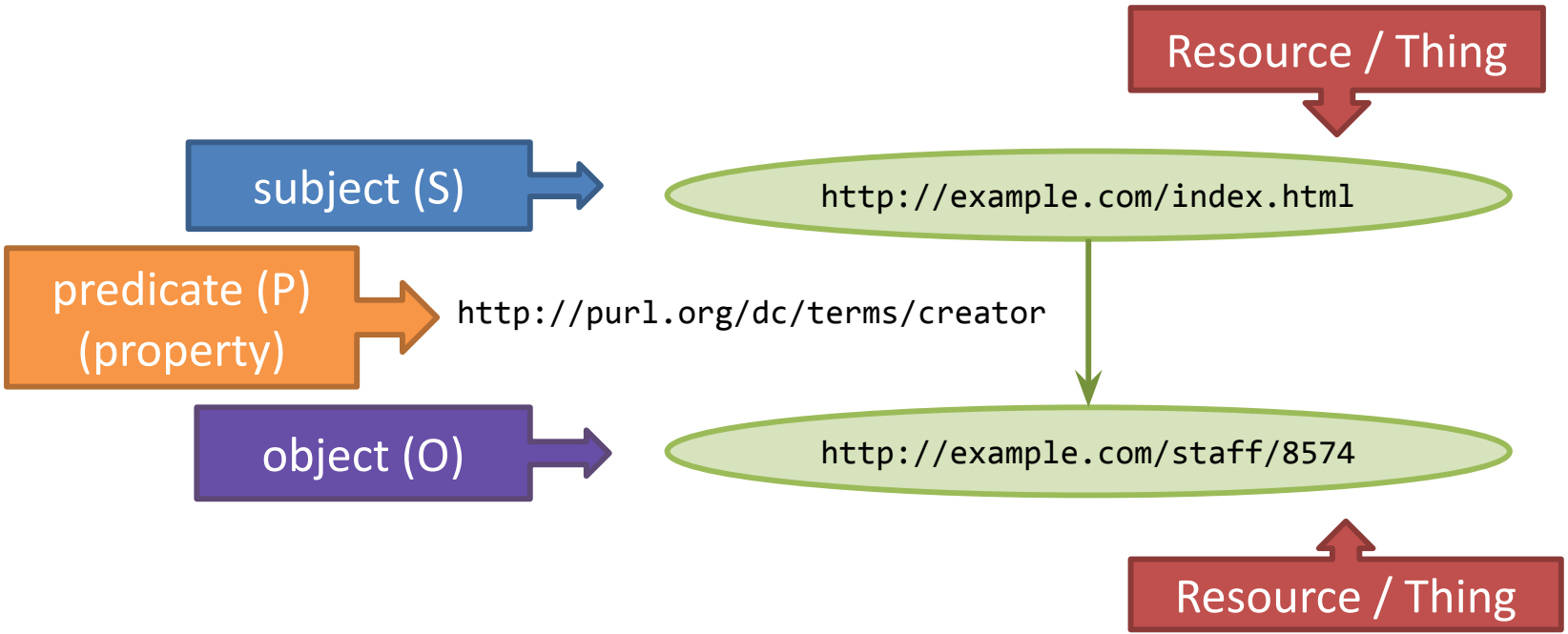
Graph data formats: common RDF vocabularies

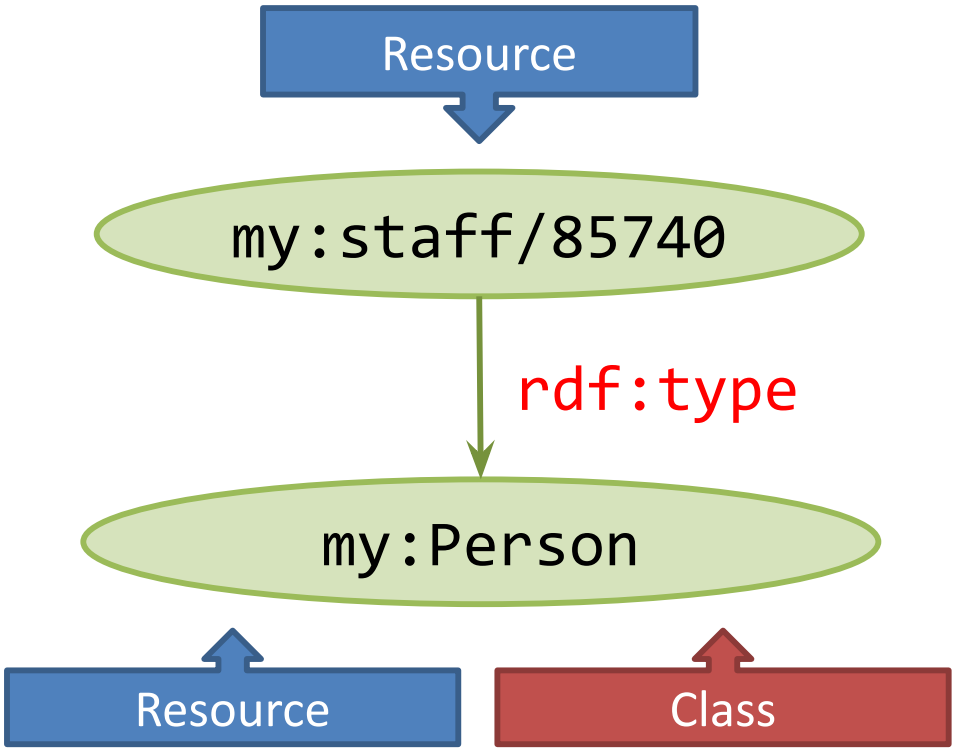
Jakub Klímek

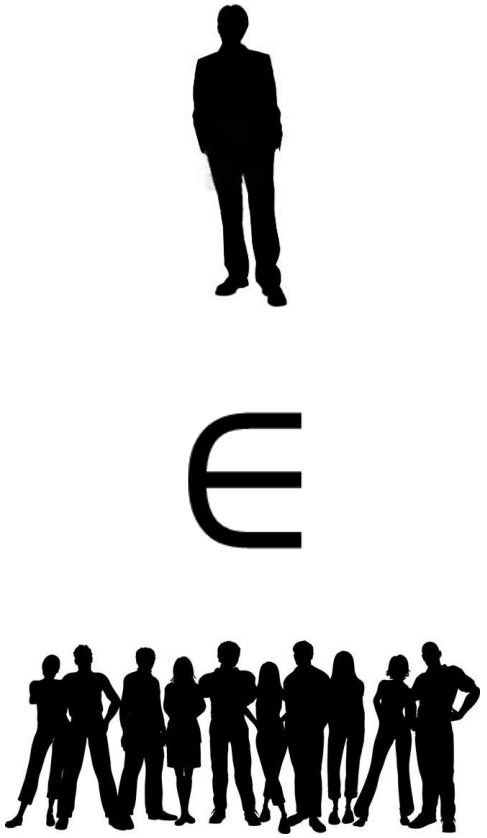
RDF model: a triple, a statement

```
<http://example.com/index.html> <http://purl.org/dc/terms/creator> <http://example.com/staff/8574> .
```



RDF model: classes





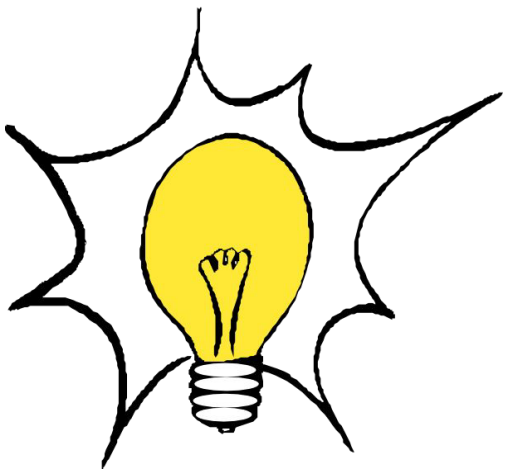
Dublin Core

Need for standardization

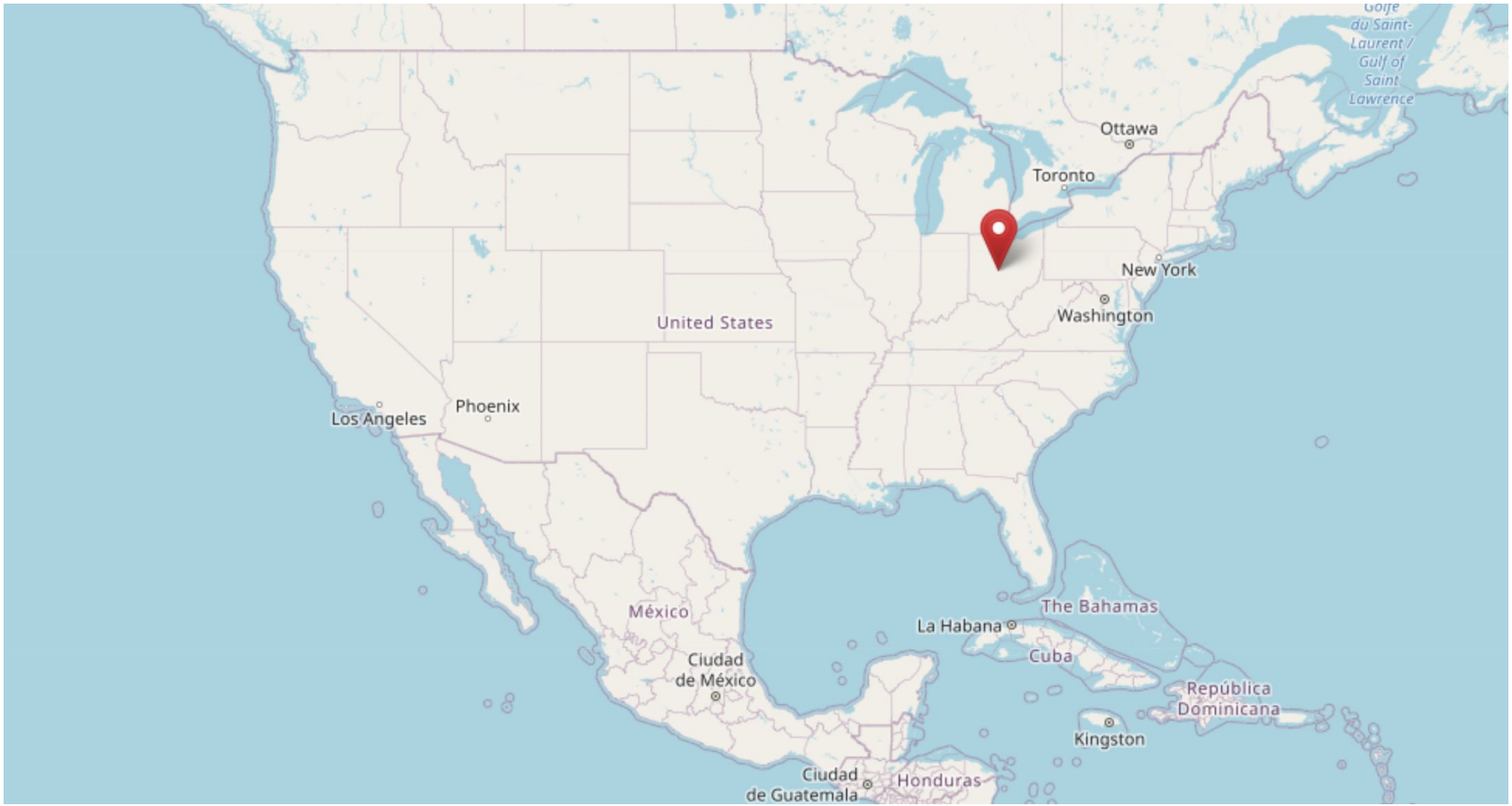
Name

Label

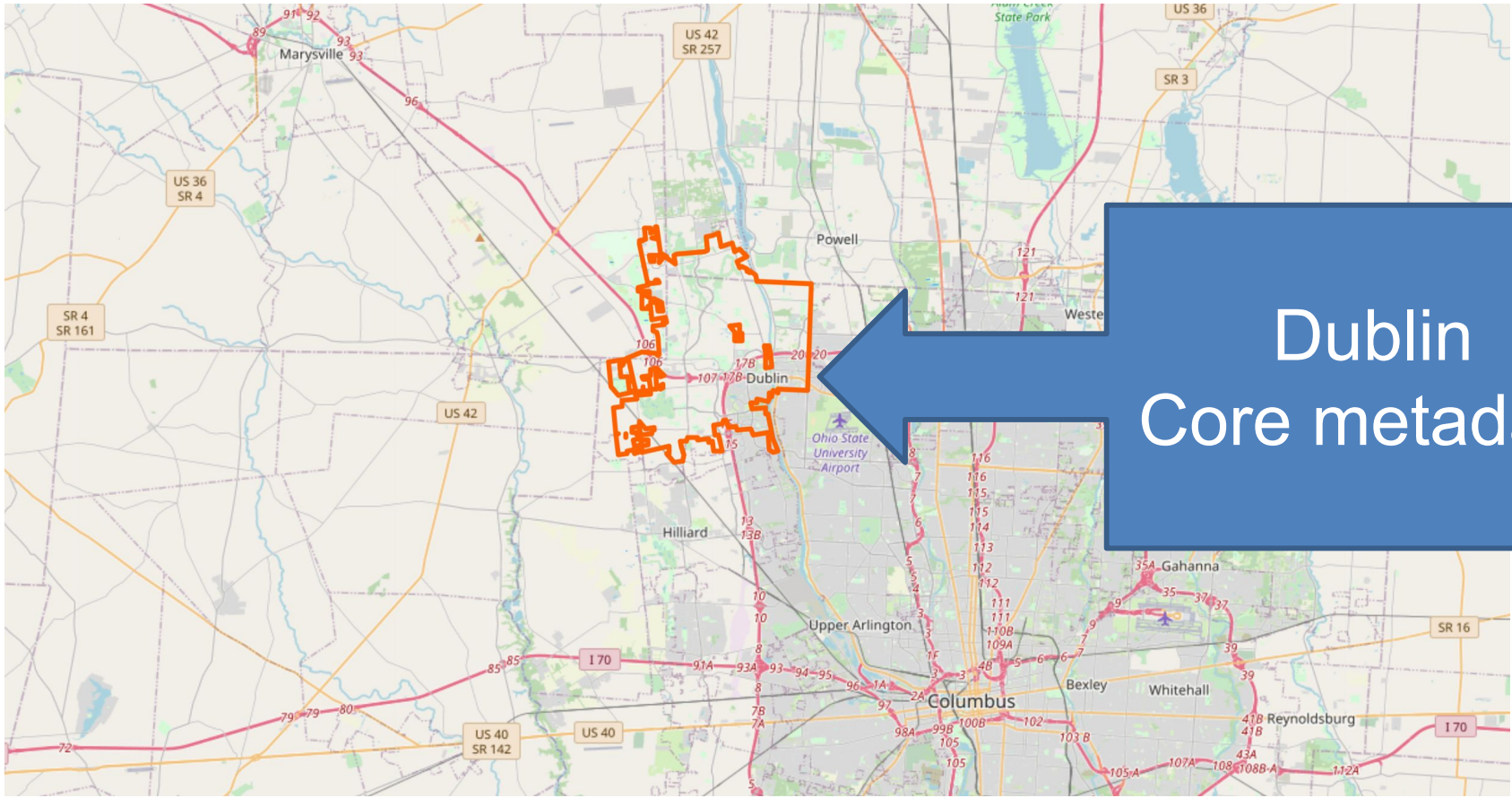
Title



1995: OCLC/NCSA Metadata Workshop

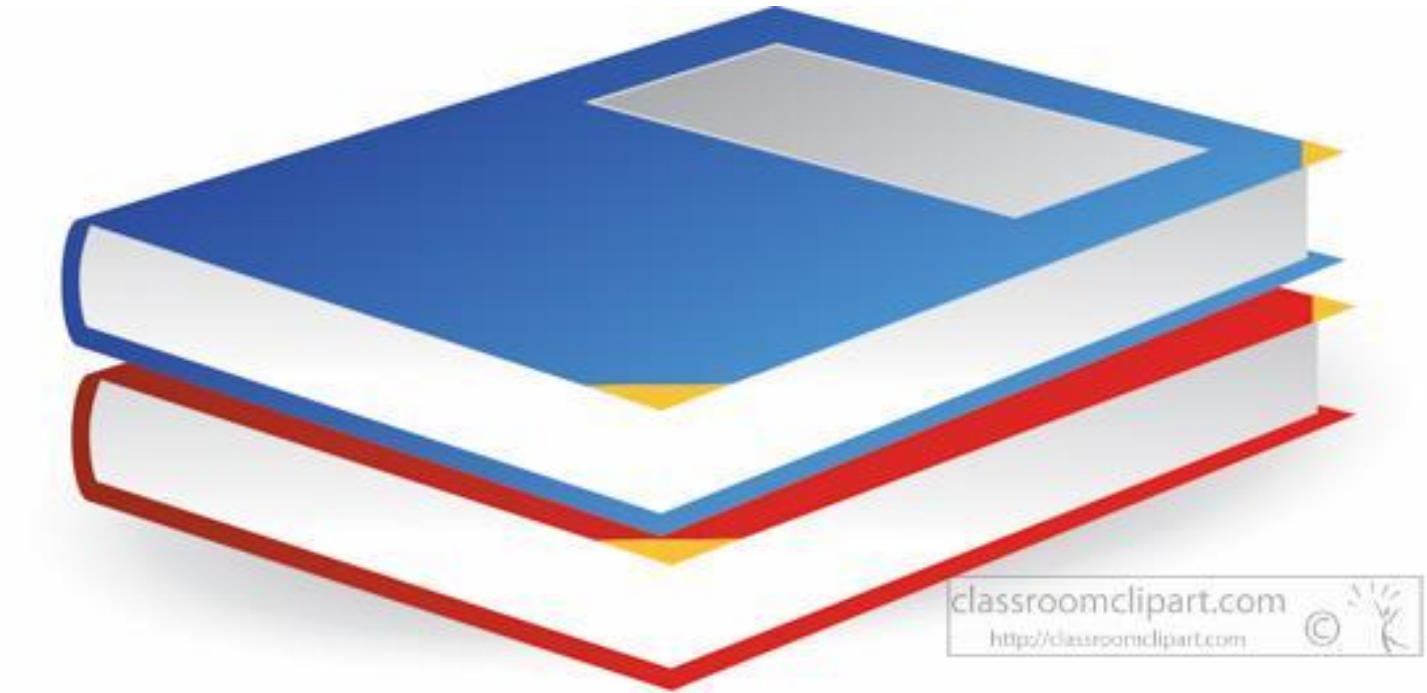


1995: OCLC/NCSA Metadata Workshop



1995: Dublin Core metadata

contributor
coverage
creator
date
description,
format,
identifier,
language,
publisher,
relation,
rights,
source,
subject,
title,
type

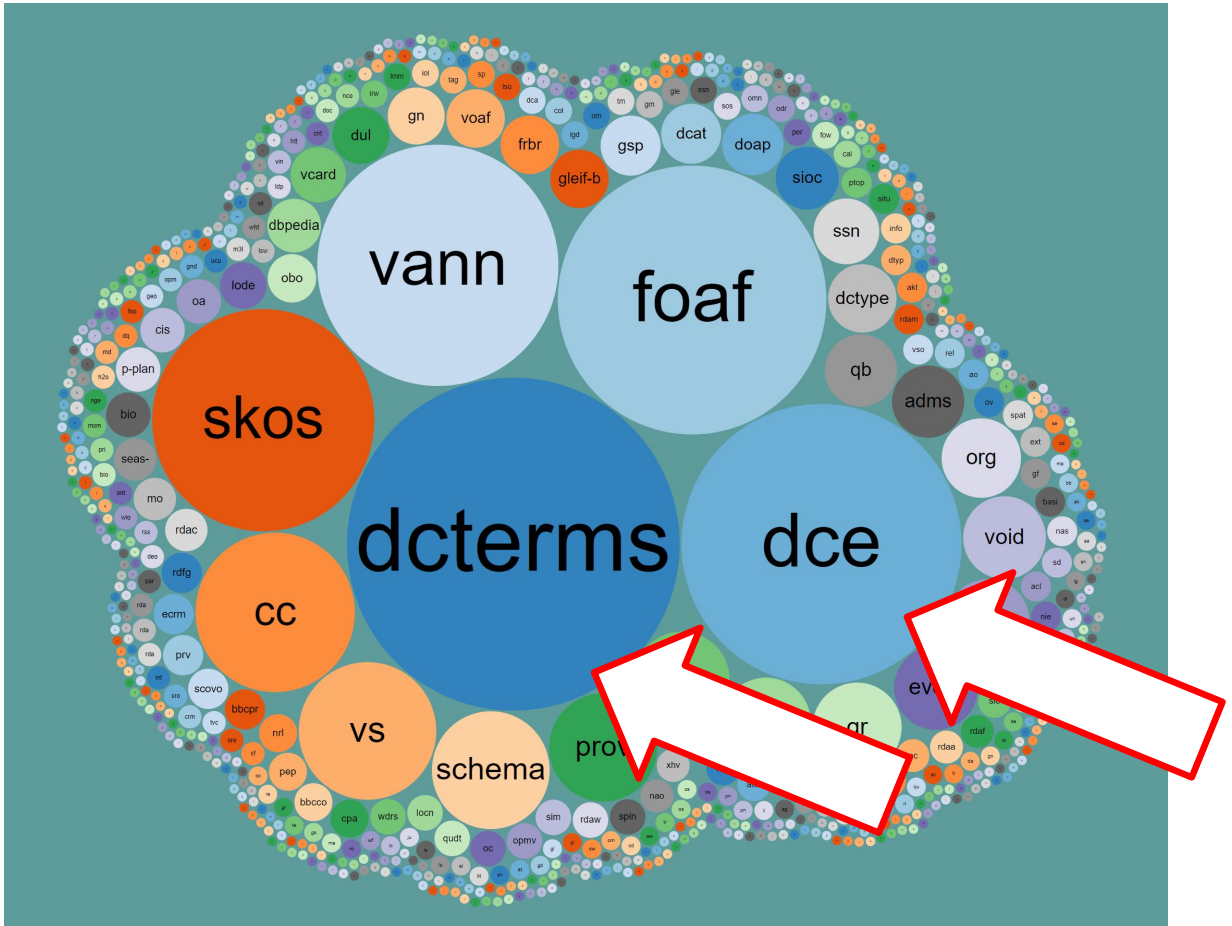


dcterms: DCMI Metadata Terms

Dublin Core Metadata Initiative (DCMI)

- DCMI Metadata Terms
  - latest update: 2020-01-20
- 2 namespaces
  - http://purl.org/dc/elements/1.1/
    - The original one
    - dc: prefix
    - **Deprecated** for our purposes
  - http://purl.org/dc/terms/
    - The one we use
    - dcterms: prefix

Position in Linked Open Vocabularies



Example: dcterms:publisher

Term Name: publisher

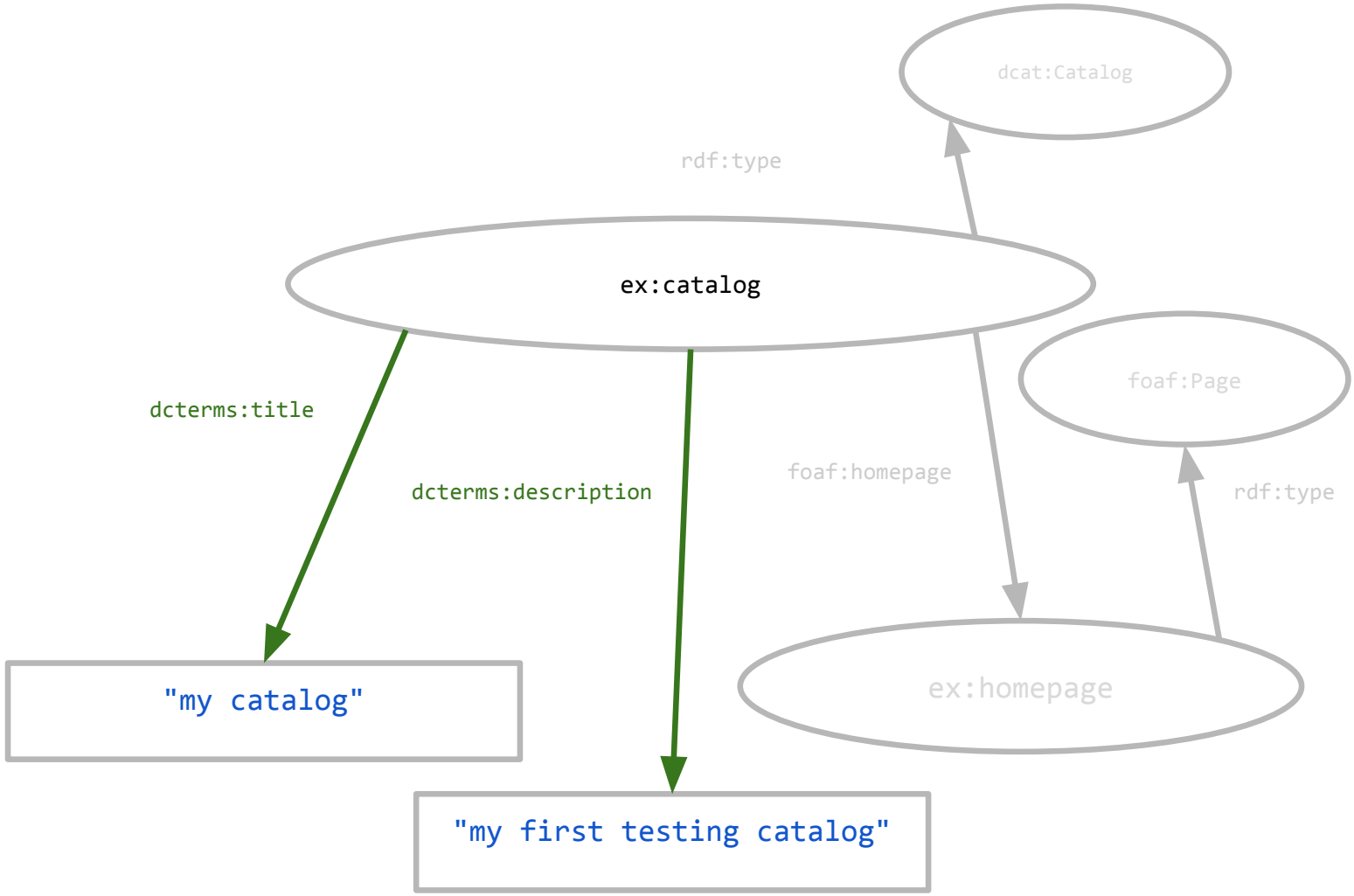
More details

URI	http://purl.org/dc/terms/publisher
Label	Publisher
Definition	An entity responsible for making the resource available.
Type of Term	Property
Range Includes	● http://purl.org/dc/terms/Agent
Subproperty of	● Publisher (http://purl.org/dc/elements/1.1/publisher)

dcterms: DCMI Metadata Terms

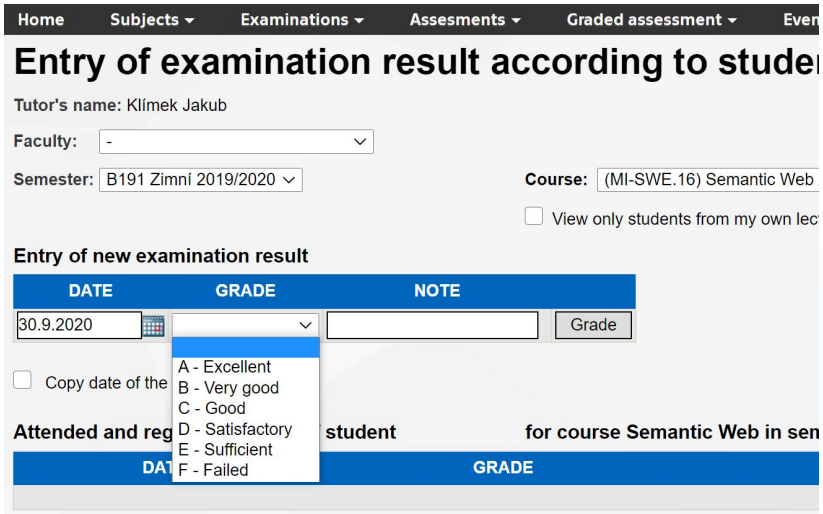
Properties in the /terms/ namespace: abstract, accessRights, accrualMethod, accrualPeriodicity, accrualPolicy, alternative, audience, available, bibliographicCitation, conformsTo, contributor, coverage, created, creator, date, dateAccepted, dateCopyrighted, dateSubmitted, description, educationLevel, extent, format, hasFormat, hasPart, hasVersion, identifier, instructionalMethod, isFormatOf, isPartOf, isReferencedBy, isReplacedBy, isRequiredBy, issued, isVersionOf, language, license, mediator, medium, modified, provenance, publisher, references, relation, replaces, requires, rights, rightsHolder, source, spatial, subject, tableOfContents, temporal, title, type, valid

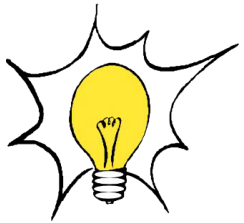
Classes: Agent, AgentClass, BibliographicResource, FileFormat, Frequency, Jurisdiction, LicenseDocument, LinguisticSystem, Location, LocationPeriodOrJurisdiction, MediaType, MediaTypeOrExtent, MethodOfAccrual, MethodOfInstruction, PeriodOfTime, PhysicalMedium, PhysicalResource, Policy, ProvenanceStatement, RightsStatement, SizeOrDuration, Standard

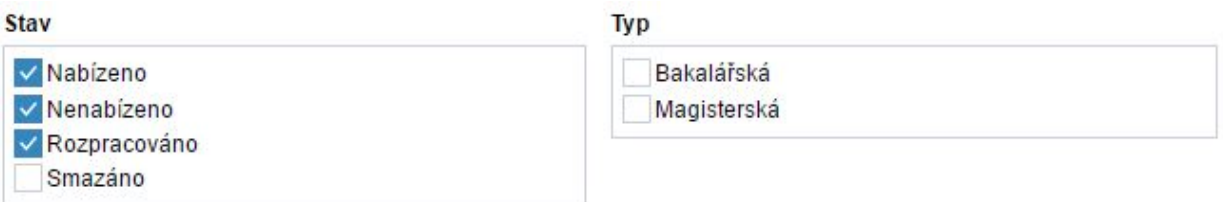

dcat:Catalog
rdf:type
ex:catalog
dcterms:title
dcterms:description
foaf:homepage
foaf:Page
rdf:type
"my catalog"
ex:homepage
"my first testing catalog"

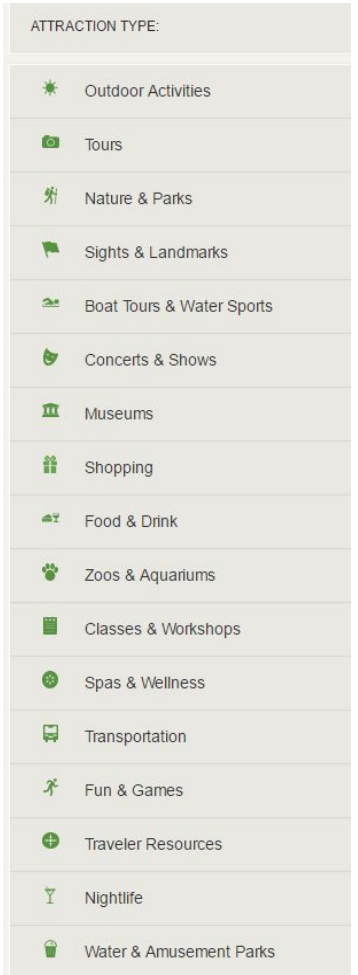
SKOS
Simple Knowledge Organization System

Codelists, taxonomies





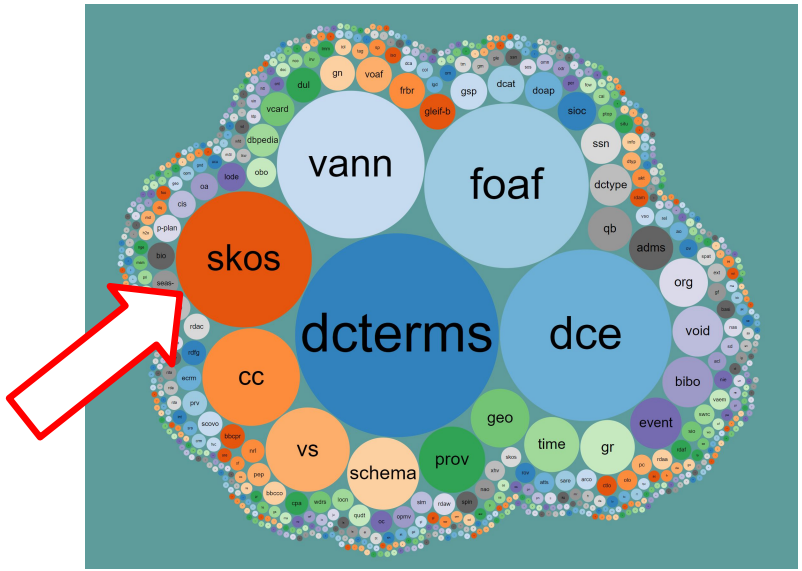




SKOS: Simple Knowledge Organization System

SKOS Simple Knowledge Organization System

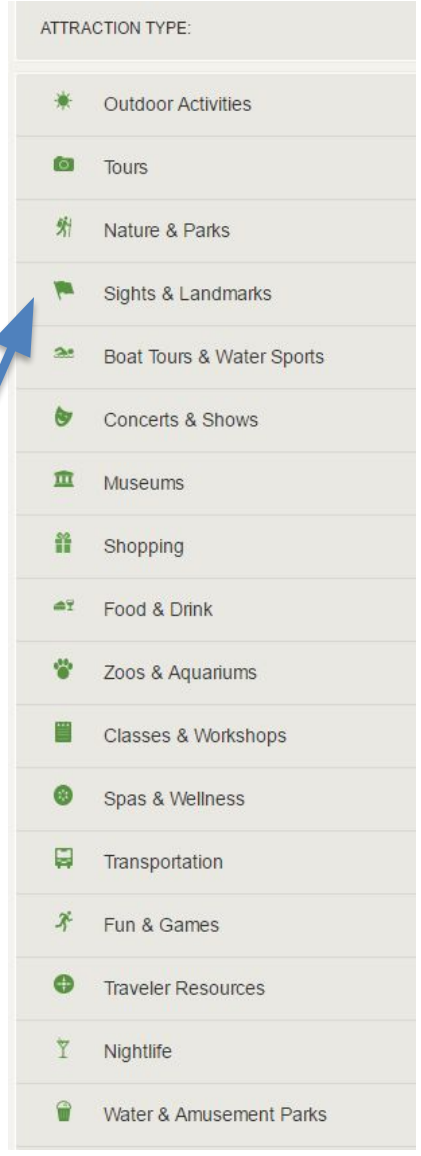
- W3C Recommendation
- 18 August 2009
- For hierarchies and collections of concepts
- skos: http://www.w3.org/2004/02/skos/core#



skos:Concept

- Core class of SKOS
- Idea, notion, unit of thought

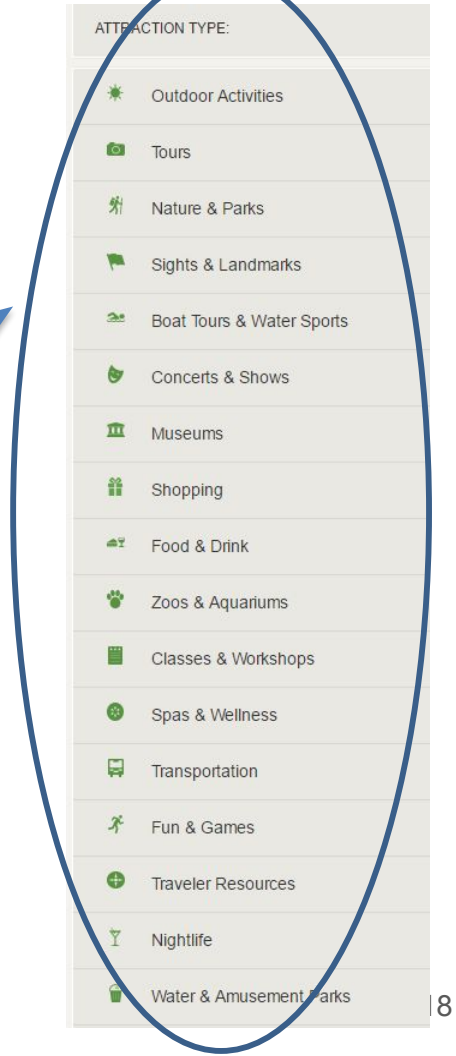
```
<https://example.org/resource/attraction-types/sights-and-landmarks>
 a skos:Concept .
```



skos:ConceptScheme

- Aggregation of one or more concepts
- Semantic relations between the concepts
- Roughly corresponds to
  - Individual thesaurus
  - Classification scheme
  - Subject heading system
  - …

```
<https://example.org/resource/attraction-types> a skos:ConceptScheme ;
    skos:hasTopConcept <https://example.org/resource/attraction-types/sights-and-landmarks> .

<https://example.org/resource/attraction-types/sights-and-landmarks> a skos:Concept ;
    skos:inScheme <https://example.org/resource/attraction-types> ;
    skos:topConceptOf <https://example.org/resource/attraction-types> .
```



SKOS: Lexical Label

String in a given natural language

skos:prefLabel

- Human readable representation
- one per language

skos:altLabel

- Human readable representation
- multiple per language, cannot be the same as prefLabel

skos:hiddenLabel

- For example for common misspellings
- We want to use it in search, but we do not want the users to see it

```
<MyConcept>
  skos:prefLabel "animals"@en ;
  skos:altLabel "fauna"@en ;
  skos:hiddenLabel "aminals"@en ;
  skos:prefLabel "animaux"@fr ;
  skos:altLabel "faune"@fr .
```

skos:notation

- A string of characters
  - e.g."T58.5" or "303.4833"
  - uniquely identifies a concept within concept scheme
- Not normally recognizable as a word in any natural language
  - does not have a language tag
  - can have a custom data type

```
<MyConcept> skos:notation "303.4833"^^<MyNotationDatatype> .
```

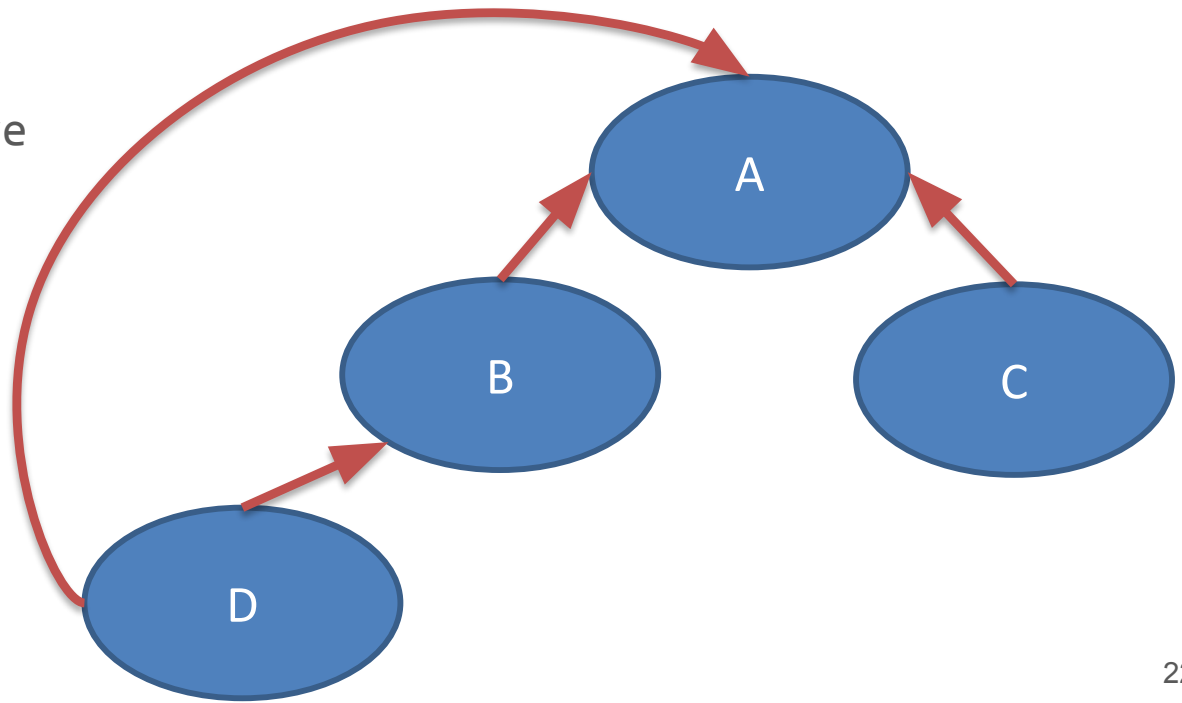
SKOS Concept Scheme example

```
@prefix atold: <http://publications.europa.eu/resource/authority/> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .

<http://publications.europa.eu/resource/authority/continent/AFRICA> a skos:Concept ;
    skos:inScheme atold:continent ;
    skos:prefLabel "Африка"@bg ,
        "Africa"@cs,
        ...
        "Africa"@en .

<http://publications.europa.eu/resource/authority/continent/AMERICA> a skos:Concept ;
    skos:inScheme atold:continent ;
    skos:prefLabel "Америка"@bg,
        "Amerika"@cs,
        ...
        "America"@en .
```

```
atold:continent a skos:ConceptScheme ;
    rdfs:label "Continent"@en ;
    skos:prefLabel "Continent"@en .
```

SKOS: Semantic Relations

- skos:semanticRelation
  - skos:related
  - skos:broaderTransitive
    - skos:broader
  - skos:narrowerTransitive
    - skos:narrower



SKOS: Collections

Useful if some concepts share something in common and/or can be meaningfully ordered.

- skos:Collection
  - skos:member
- skos:OrderedCollection
  - skos:memberList

```
<MyCollection> a skos:Collection ;
  skos:member <A> , <B> , <MyNestedCollection> .

<MyNestedCollection> a skos:Collection ;
  skos:member <X> , <Y> , <Z> .

<MyOrderedCollection> a skos:OrderedCollection ;
  skos:memberList ( <X> <Y> <Z> ) .
```

SKOS: Mappings

To specify mapping/alignment between schemes.

- `skos:mappingRelation`
  - `skos:closeMatch` (not transitive)
    - `skos:exactMatch` (transitive)
  - `skos:relatedMatch`
  - `skos:broadMatch`
  - `skos:narrowMatch`

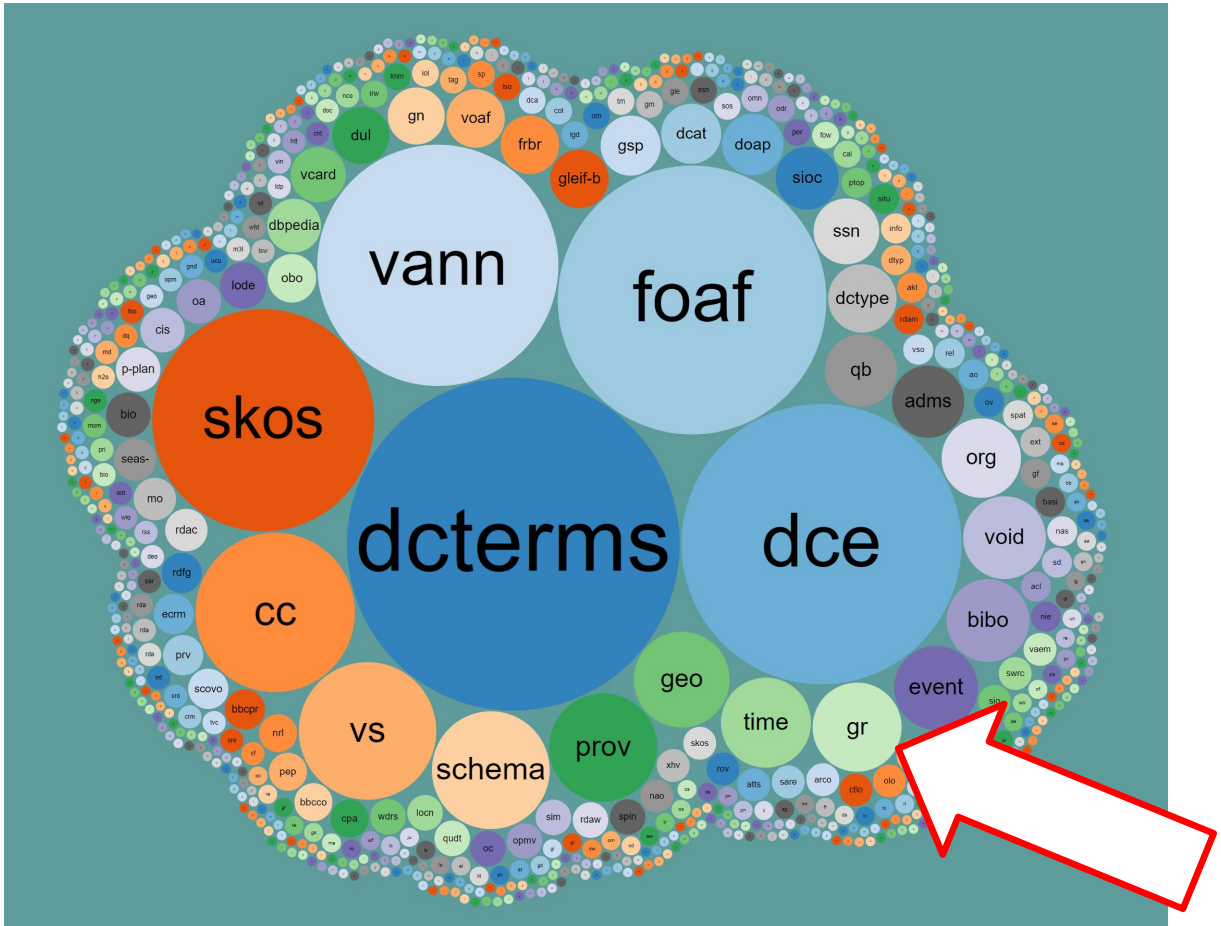
```
<https://data.mvcr.gov.cz/zdroj/číselníky/pohlaví/položky/ženské> a skos:Concept;
  skos:inScheme <https://data.mvcr.gov.cz/zdroj/číselníky/pohlaví>;
  skos:prefLabel "Female"@en, "Ženské"@cs ;
  skos:exactMatch <https://data.cssz.cz/resource/ciselniky/ciselnik-pohlavi/2/2009-01-01>,
                  <http://publications.europa.eu/resource/authority/human-sex/FEMALE> .
```

GoodRelations

GoodRelations

- GoodRelations - The Web Vocabulary for E-Commerce
  - Author: Martin Hepp
- Used by Google, Yahoo, BestBuy, sears.com, kmart.com
  - and 10 000 more...
- Syntax-neutral
  - Microdata, RDFa, RDF/XML, **Turtle**, JSON, OData, GData, …
- Industry-neutral
  - consumer electronics, cars, tickets, real-estate, ...
- Different stages of the value chain
  - raw materials, after-sales services, …
- Rich Snippet Generator

Position in Linked Open Vocabularies

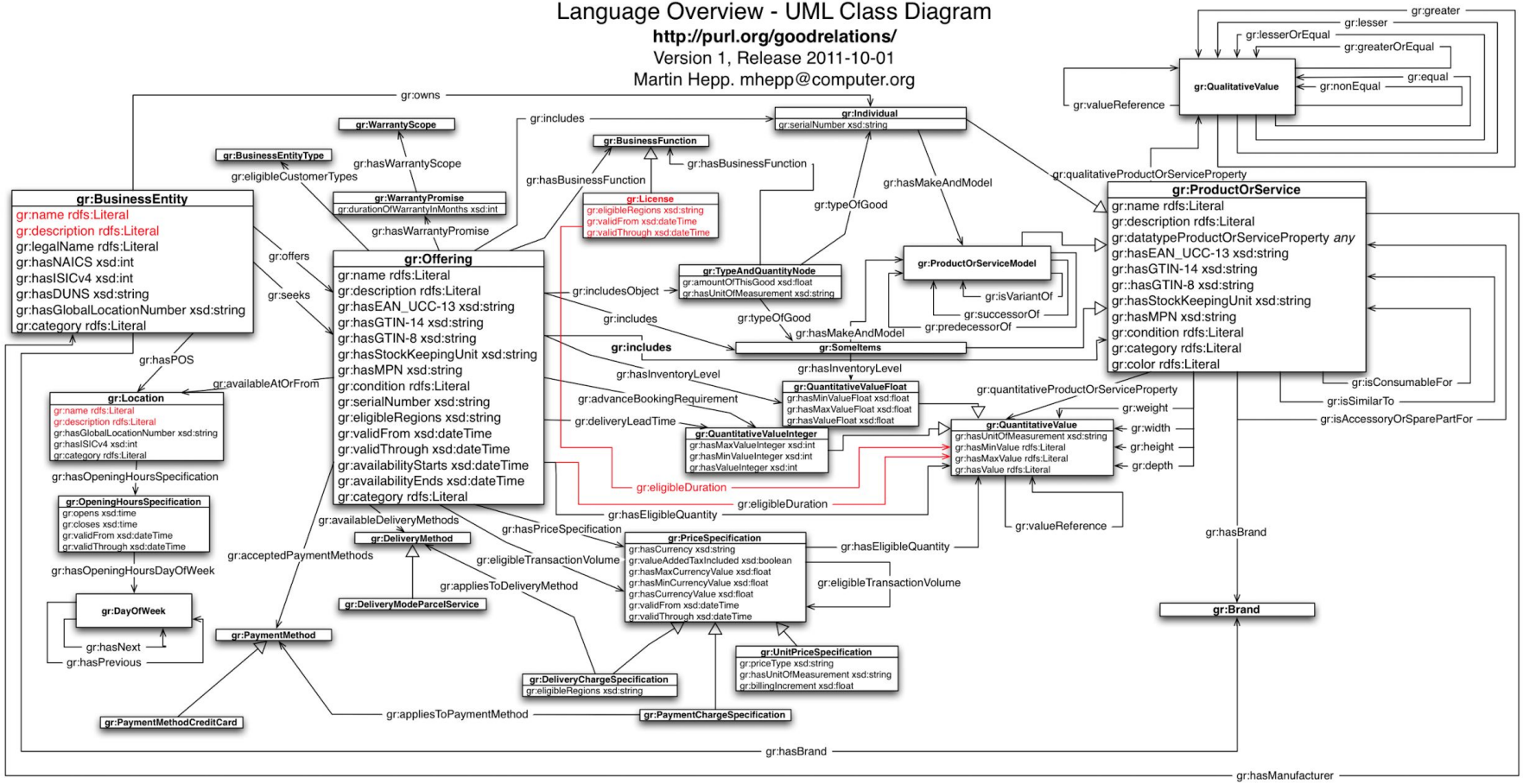


The GoodRelations Ontology for E-Commerce
Language Overview - UML Class Diagram

http://purl.org/goodrelations/

Version 1, Release 2011-10-01

Martin Hepp. mhepp@computer.org



Notes:

1. The following GoodRelations elements are only shortcuts for simpler annotation or querying. See the documentation at http://purl.org/goodrelations/ for details:
   gr:hasValue (shortcut for setting both hasMinValue and hasMaxValue properties to the same value in one turn)
   gr:hasValueFloat (shortcut for setting both hasMinValueFloat and hasMaxValueFloat properties to the same value in one turn)
   gr:hasValueInteger (shortcut for setting both hasMinValueInteger and hasMaxValueInteger properties to the same value in one turn)
2. The following elements are now deprecated, but you can still use them, e.g. for staying compatible with older data consumers (e.g. Yahoo SearchMonkey):
   gr:ActualProductOrServiceInstance (now gr:Individual)
   gr:ProductOrServicesSomeInstancesPlaceholder (now gr:SomeItems)
   gr:LocationOfSalesOrServiceProvisioning (now gr:Location
3. For the recommended cardinality of attributes, see the GoodRelations Language Reference at http://purl.org/goodrelations/ v1.html.
4. gr:valueReference links can also exist between a gr:QualitativeValue and a gr:QuantitativeValue and vice versa, but this rare case is not shown for readability.
5. gr:name and gr:description can now be attached to any GoodRelations type, but this is not shown here for readability.

Red highlighting indicates elements added or changed in this release.

GoodRelations
The Web Vocabulary for E-Commerce
http://purl.org/goodrelations/

GoodRelations - the Agent-Promise-Object principle

1. Agent - `gr:BusinessEntity`
   a. person or organization
2. Object or service - `gr:ProductOrService`
   a. camcorder, house, car
   b. haircut
3. Promise (offer) - `gr:Offering`
   a. To transfer some rights (ownership, usage, license) on the object or
   b. To provide the service for a certain compensation (money)
   c. Made by the agent and related to the object or service
4. Location - `gr:Location`
   a. From which this offer is available
      i. store, bus stop, gas station

GoodRelations - gr:BusinessEntity

```
foo:ACME a gr:BusinessEntity;
    gr:legalName "ACME Bagel Bakery Ltd."@en;
    foaf:page <http://www.example.com/>;
    s:address [ a s:PostalAddress;
                s:streetAddress "Bagel Street 1234";
                s:postalCode "12345";
                s:addressLocality "Munich, Germany" ];
    s:telephone "+49-89-12345678-0";
    s:faxNumber "+49-89-12345678-99";
    s:email "contact@example.org".
```

GoodRelations - gr:Location

```
foo:pos a gr:Location;
    gr:name "Hepp's Bagel Restaurant Munich - Bagel Street"@en;
    s:address [ a s:PostalAddress;
                s:streetAddress "Bagel Street 1234";
                s:postalCode "12345";
                s:addressLocality "Munich, Germany" ];
    s:geo [ a s:GeoCoordinates ;
            s:latitude 45.75;
            s:longitude 49.98 ];
    s:telephone "+49-89-12345678-0" .
```

GoodRelations - `gr:OpeningHoursSpecification`

- One `gr:OpeningHoursSpecification` entity specifies a time interval, and links to days
- Typically, full specification contains multiple entities

```
foo:restaurant a gr:Location;
    gr:name "Hepp's Happy Burger Restaurant"@en;
    gr:hasOpeningHoursSpecification
         [ a gr:OpeningHoursSpecification;
           gr:opens "08:00:00"^^xsd:time;
           gr:closes "12:00:00"^^xsd:time;
           gr:hasOpeningHoursDayOfWeek gr:Monday,
           gr:Tuesday, gr:Wednesday, gr:Thursday,
           gr:Friday ],
         [ a gr:OpeningHoursSpecification;
           gr:opens "13:00:00"^^xsd:time;
           gr:closes "20:00:00"^^xsd:time;
           gr:hasOpeningHoursDayOfWeek
           gr:Friday ] .
```

GR - gr:Offering, gr:PriceSpecification

```
foo:offer a gr:Offering;
     gr:name "Hepp Personal SCSI Controller Card"@en;
     gr:description """The Hepp Personal SCSI is a 16-bit add-on
card that allows attaching up to seven SCSI devices to your
computer."""@en;

     gr:hasBusinessFunction gr:Sell;
     gr:condition "used";

     gr:hasEAN_UCC-13 "1234567890123"^^xsd:string;
     gr:hasMPN "PSCSI"^^xsd:string;
     gr:hasStockKeepingUnit "123-456"^^xsd:string;
     gr:hasInventoryLevel [ a gr:QuantitativeValue;
                            gr:hasMinValue "1"^^xsd:float ];

     s:aggregateRating [ a s:AggregateRating;
                         s:ratingValue "4.9"^^xsd:float;
                         s:reviewCount 99 ];

     foaf:depiction <http://example.com/images/pscsi.jpg>;
     foaf:page <http://example.com/products/pscsi> .
```

```
foo:offer a gr:Offering;
      gr:hasPriceSpecification [ a gr:UnitPriceSpecification;
          gr:hasCurrency "USD"^^xsd:string;
          gr:hasCurrencyValue "99.99"^^xsd:float;
          gr:validThrough "2012-11-30T23:59:59"^^xsd:dateTime ];
```

GoodRelations – Product or Service

- A real product
  - e.g. my laptop with its serial number
  - e.g. my car with its VIN and mileage
  - e.g. a particular item on eBay
  - Can be sold only once
  - `gr:Individual`
- A product model
  - Nikon T90, iPod Nano 16 GB
  - Abstract definition, not a particular item
  - In GoodRelations modeled as prototype
  - In contrast to modeling as datasheet
  - `gr:ProductOrServiceModel`

- Black boxes of products
  - Amazon page for a new book
    - multiple ones in stock, not list of individual ones
  - Difference: Statements about the same entity do not imply that the statements refer to the same individual product
    - some statements may be about a subset
    - some statements may be about a different subset
  - Multiple items of some type, can be sold more times
  - `gr:SomeItems`

GoodRelations – Product or Service

```
foo:myVolkswagenBeetle a <http://www.productontology.org/id/Automobile>, gr:Individual;
    gr:name "1973 Volkswagen Beetle"@en;
    gr:description """This car is simply unique - it has been owned by Madonna."""@en .

foo:model a gr:ProductOrServiceModel;
    gr:name "ACME Colorvision 123"@en;
    gr:description "The ACME Colorvision 123 is the leading-edge color TV from our company."@en;
    gr:hasEAN_UCC-13 "1234567890123"^^xsd:string;
    gr:width [ a gr:QuantitativeValue;
               gr:hasValueFloat "102.0"^^xsd:float;
               gr:hasUnitOfMeasurement "CMT"^^xsd:string ];
    gr:height [ a gr:QuantitativeValue;
               gr:hasValueFloat "60.0"^^xsd:float;
               gr:hasUnitOfMeasurement "CMT"^^xsd:string ].
```

GoodRelations – Product or Service

```
foo:product a gr:SomeItems;
    gr:name "Canon Rebel T2i (EOS 550D)"@en;
    gr:description "The Rebel T2i EOS 550D is Canon's latest digital SLR camera."@en;
    gr:hasEAN_UCC-13 "9781906672799"^^xsd:string;
    foaf:depiction <http://www.example.com/canon_rebel_t2i.jpg>;
    foaf:page <http://www.example.com/canon_rebel_t2i.html> .
```

GoodRelations - Linking the Data

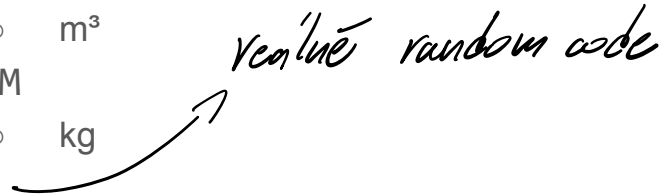
```
foo:be a gr:BusinessEntity;
    gr:offers foo:offer .
foo:offer a gr:Offering .

foo:offer a gr:Offering;
    gr:includes foo:product .

foo:be a gr:BusinessEntity;
    gr:hasPOS foo:pos .
foo:pos a gr:Location .
```

GoodRelations - gr:QuantitativeValue

```
foo:product a gr:ProductOrServiceModel;
    gr:name "ACME Electric Anvil"@en;
    gr:weight [ a gr:QuantitativeValue;
                gr:hasUnitOfMeasurement "KGM"^^xsd:string;
                gr:hasValue "50"^^xsd:float ];
    foo:voltage [ a gr:QuantitativeValue;
                gr:hasUnitOfMeasurement "VLT"^^xsd:string;
                gr:hasMinValue "100"^^xsd:integer;
                gr:hasMaxValue "220"^^xsd:integer ].
```

Documentation/UN/CEFACT Common Codes

- MTR
  - m
- MTK
  - m²
- MTQ
  - m³
- KGM
  - kg
- 28
  - kg/m²
- C62
  - 1 (no unit)
- …



GoodRelations - gr:QualitativeValue

```
foo:GarmentSize a rdfs:Class;
    rdfs:subClassOf gr:QualitativeValue;
    rdfs:label "Garment sizes (value class)"@en.

foo:M a foo:GarmentSize;
    rdfs:label "M - Medium."@en;
    gr:lesser foo:L.

foo:L a foo:GarmentSize;
    rdfs:label "L - Large."@en;
    gr:greater foo:M.
```

```
foo:size a rdf:Property ;
   rdfs:subPropertyOf gr:qualitativeProductOrServiceProperty ;
   rdfs:range foo:GarmentSize ;
   rdfs:label "size (0..1)"@en .

foo:tshirt a gr:SomeItems;
    gr:name "Blue T-Shirt (Size M)"@en;
    gr:color "blue"@en;
    foo:size foo:M.
```

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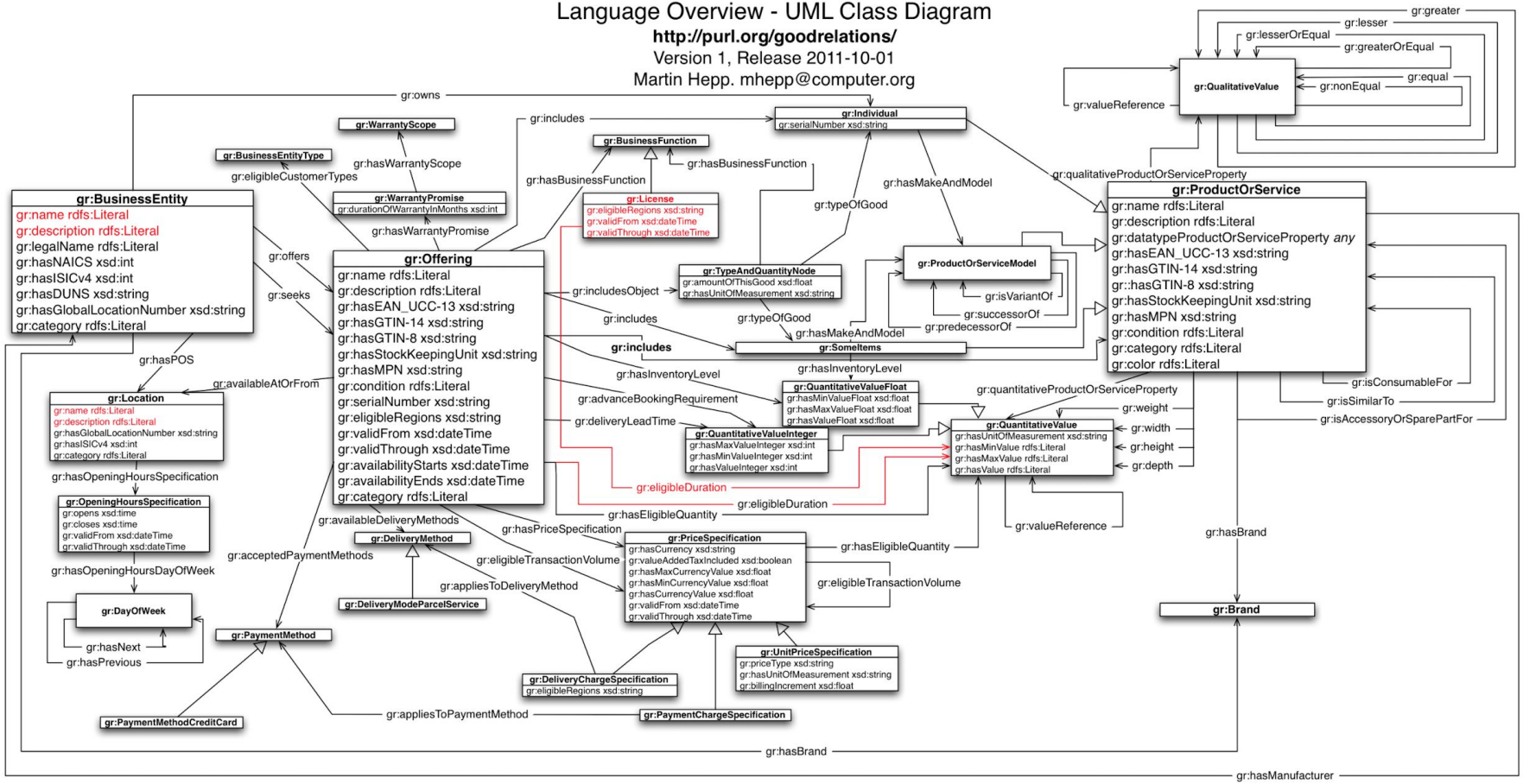

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   gr:hasValueFloat (shortcut for setting both hasMinValueFloat and hasMaxValueFloat properties to the same value in one turn)
   gr:hasValueInteger (shortcut for setting both hasMinValueInteger and hasMaxValueInteger properties to the same value in one turn)
2. The following elements are now deprecated, but you can still use them, e.g. for staying compatible with older data consumers (e.g. Yahoo SearchMonkey):
   gr:ActualProductOrServiceInstance (now gr:Individual)
   gr:ProductOrServicesSomeInstancesPlaceholder (now gr:SomeItems)
   gr:LocationOfSalesOrServiceProvisioning (now gr:Location
3. For the recommended cardinality of attributes, see the GoodRelations Language Reference at http://purl.org/goodrelations/ v1.html.
4. gr:valueReference links can also exist between a gr:QualitativeValue and a gr:QuantitativeValue and vice versa, but this rare case is not shown for readability.
5. gr:name and gr:description can now be attached to any GoodRelations type, but this is not shown here for readability.

Red highlighting indicates elements added or changed in this release.

GoodRelations
The Web Vocabulary for E-Commerce
http://purl.org/goodrelations/

Schema.org

Schema.org

“Schema.org is a collaborative, community activity with a mission to create, maintain, and promote schemas for structured data on the Internet, on web pages, in email messages, and beyond.”

- Founded by Google, Microsoft, Yahoo and Yandex
- Integrates existing vocabularies, creates new terms
  - foaf, GoodRelations, DCAT ...
- Maintained on GitHub
- 841 types, 1369 properties, 352 enumeration values

Organization of Schemas

The schemas are a set of 'types', each associated with a set of properties. The types are arranged in a hierarchy.
The vocabulary currently consists of 841 Types, 1369 Properties, and 352 Enumeration values.

Browse the full hierarchy in HTML:

- One page per type
- Full list of types, shown on one page

Or you can jump directly to a commonly used type:

- Creative works: CreativeWork, Book, Movie, MusicRecording, Recipe, TVSeries ...
- Embedded non-text objects: AudioObject, ImageObject, VideoObject
- Event
- Health and medical types: notes on the health and medical types under MedicalEntity.
- Organization
- Person
- Place, LocalBusiness, Restaurant ...
- Product, Offer, AggregateOffer
- Review, AggregateRating
- Action

Schema.org & GoodRelations 2012 approach

```
<#model> a schema:Product ;
    schema:name "ACME Electric Anvil" ;
    schema:feature [ a schema:ProductFeature ;
        schema:propertyName "Power supply" ;
        schema:propertyValue "110-220" ;
        schema:unitText "Volts" ] ;
    schema:feature [ a schema:ProductFeature ;
        schema:propertyName "Weight" ;
        schema:propertyValue "2.25" ;
        schema:unitText "kg" ] ;
    schema:feature [ a schema:ProductFeature ;
        schema:propertyName "Safety belt" ;
        schema:propertyValue "yes" ] .
```

Schema.org - inconsistent typing conventions

Primary schema.org use case: extraction of data from web pages

Primarily based on HTML Microdata

- then RDFa
- eventually JSON-LD

=> use `rdf:langString` (language tags) and proven XML Schema datatypes

```
# xsd:string
<#model> a schema:Product ;
    schema:name "ACME Electric Anvil" .

# rdf:langString
<#model> a schema:Product ;
    schema:name "ACME Electric Anvil"@en .

# schema:Text
<#model> a schema:Product ;
    schema:name "ACME Electric Anvil"^^schema:Text .
```

Wikidata

Free encyclopedic database

- Like Wikipedia, but for facts, not documents
- Queryable via SPARQL endpoint

Community-built and community-managed

- Anyone can contribute
- Anyone can edit anything

Unlike DBpedia, where data is scraped from Wikipedia data boxes

- Queryable via SPARQL endpoint

Location within the Czech Republic
Show map of Czech Republic
Show map of Europe
Show all
Coordinates: 50°05′N 14°25′E

Country	Czech Republic
Founded	7th century
Government	
• **Mayor**	Zdeněk Hřib (Pirates)
Area[3]	
• **Capital city**	496 km^2 (192 sq mi)
• **Urban**	298 km^2 (115 sq mi)
Highest elevation	399 m (1,309 ft)
Lowest elevation	177 m (581 ft)
Population (2020-01-01[5])	
• **Capital city**	1,324,277
• **Density**	2,700/km^2 (6,900/sq mi)
• **Metro**	2,677,964[4]
• **Nationality**[6]	64.3% Czech 8.8% other nationalities 1.6% dual nationality 25.3% nationality not declared
Demonym(s)	Prague

English | Not logged in | Talk | Contributions | Create account | Log in

WIKIDATA

Item | Discussion | Read | View history | Search Wikidata

Wikidata (Q2013)

free knowledge database project hosted by the Wikimedia Foundation and edited by volunteers

WD | wikidata.org | www.wikidata.org | wikidatawiki | d: | Wiki Data

▾ In more languages

Configure

Language	Label	Description	Also known as
English	Wikidata	free knowledge database project hosted by the Wikimedia Foundation and edited by volunteers	WD wikidata.org www.wikidata.org wikidatawiki d: Wiki Data
Czech	Wikidata	svobodná databáze informací pod záštitou organizace Wikimedia	wd WD wikidata.org wikidatawiki D:
Slovak	Wikiúdaje	slobodná databáza informácií pod záštitou organizácie Wikimedia	Wikidata
German	Wikidata	freie Datenbank, die von der Wikimedia Foundation gehostet und von Freiwilligen bearbeitet wird	wikidata.org WD D: www.wikidata.org

All entered languages

Statements

instance of	Wikimedia content project ▾ 0 references
	semantic wiki ▾ 0 references

Wikipedia (101 entries)

- af Wikidata
- als Wikidata
- ar ويكي بيانات
- arz ويكيداتا
- ast Wikidata
- as ৱিকিতথ্য
- az Vikiverilənlər
- bar Wikidata
- be_x_old Вікізьвесткі
- be Вікідадзеныя
- bg Уикиданни
- bn উইকিউপাত্ত
- bs Wikipodaci
- ca Wikidata
- cdo Wikidata
- ce Викихаамаш
- ckb ویکیدراوە
- cs Wikidata
- cy Wicidata
- da Wikidata
- de Wikidata
- el Wikidata
- en Wikidata
- eo Vikidatumoj
- es Wikidata
- et Wikidata
- eu Wikidata
- fa ویکی‌داده
- fi Wikidata
- fr Wikidata

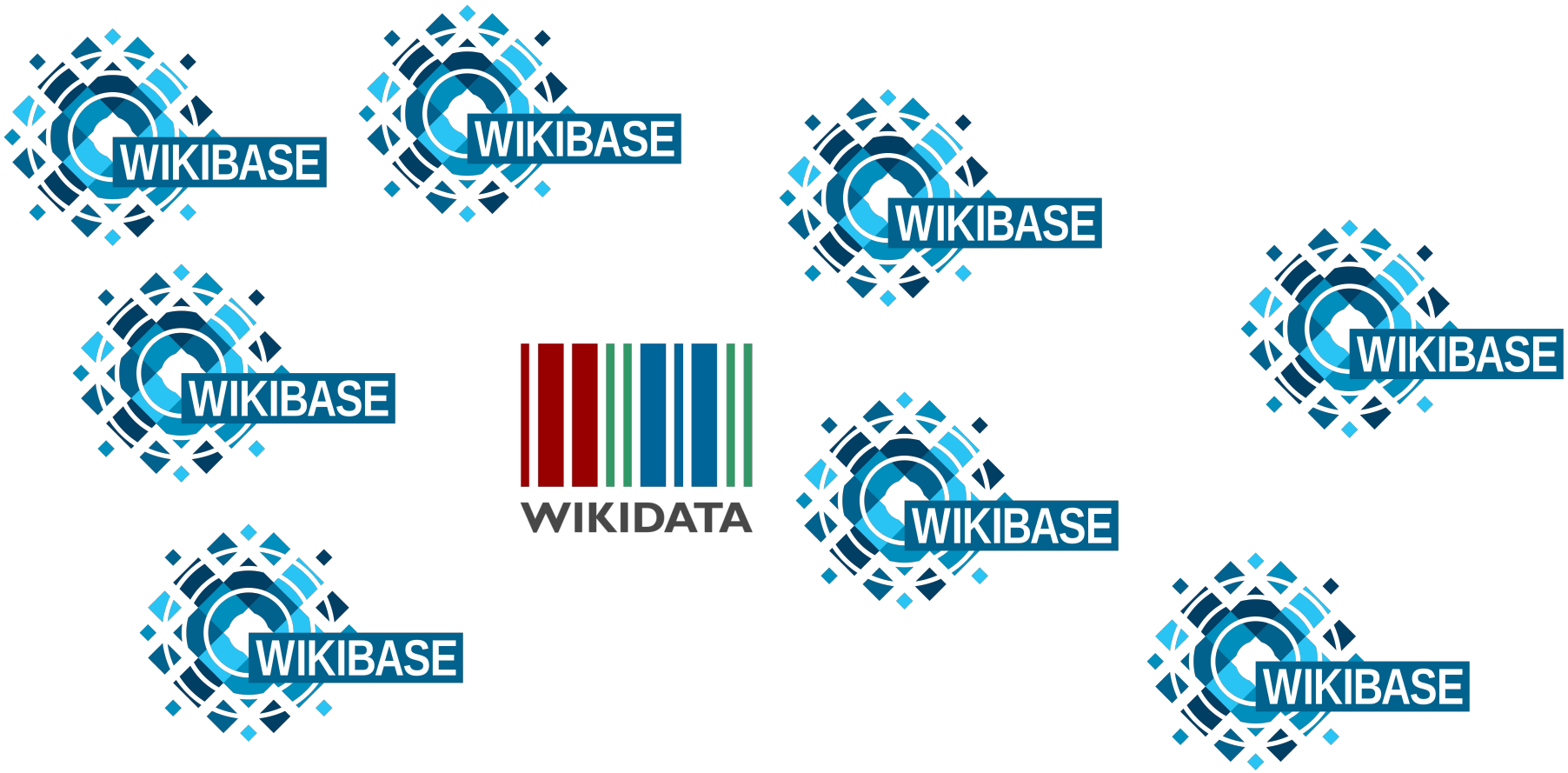
Main page
Community portal
Project chat
Create a new Item
Recent changes
Random Item
Query Service
Nearby
Help
Donate

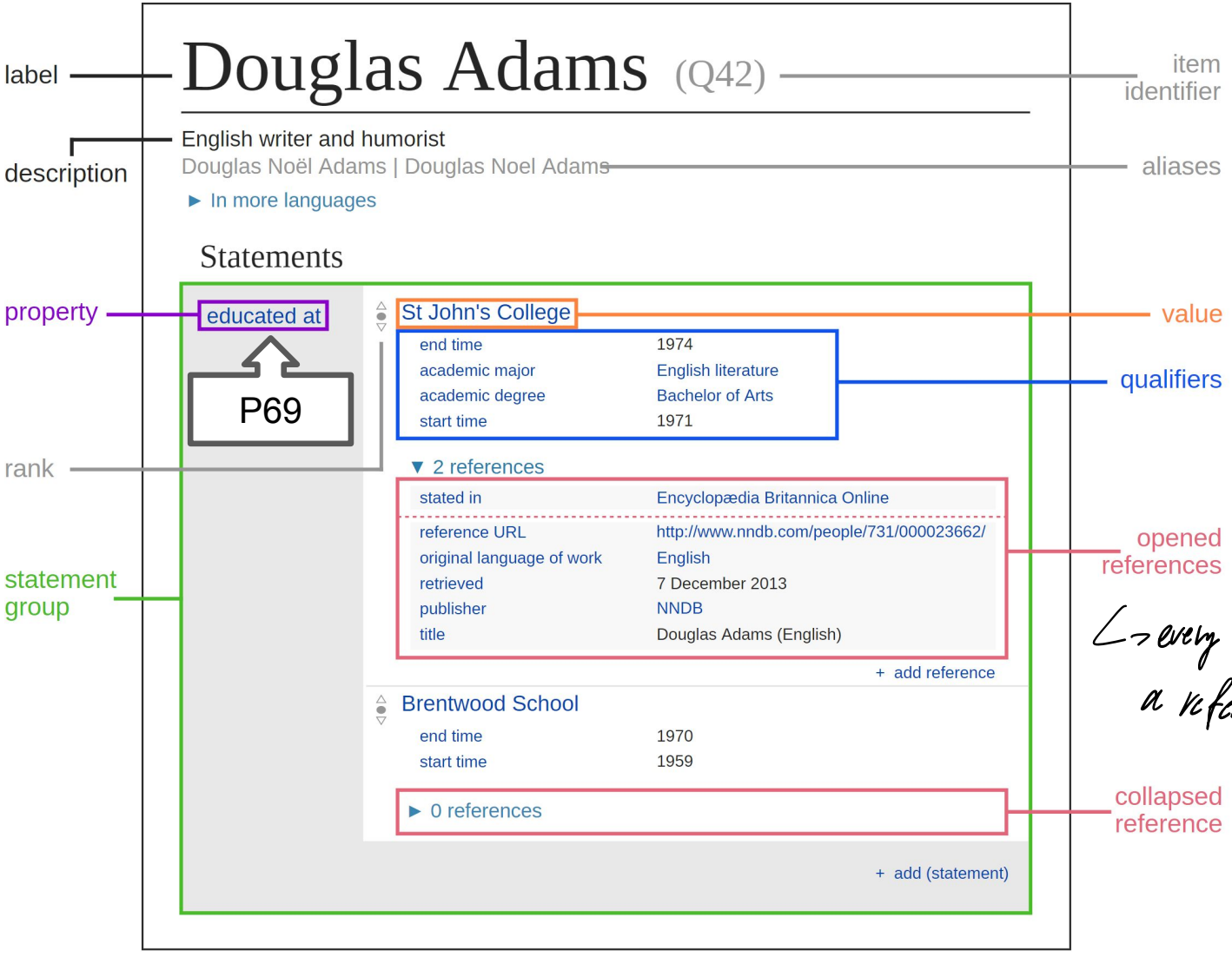
Lexicographical data
Create a new Lexeme
Recent changes
Random Lexeme

Tools
What links here
Related changes
Special pages
Permanent link
Page information
Cite this page
Concept URI

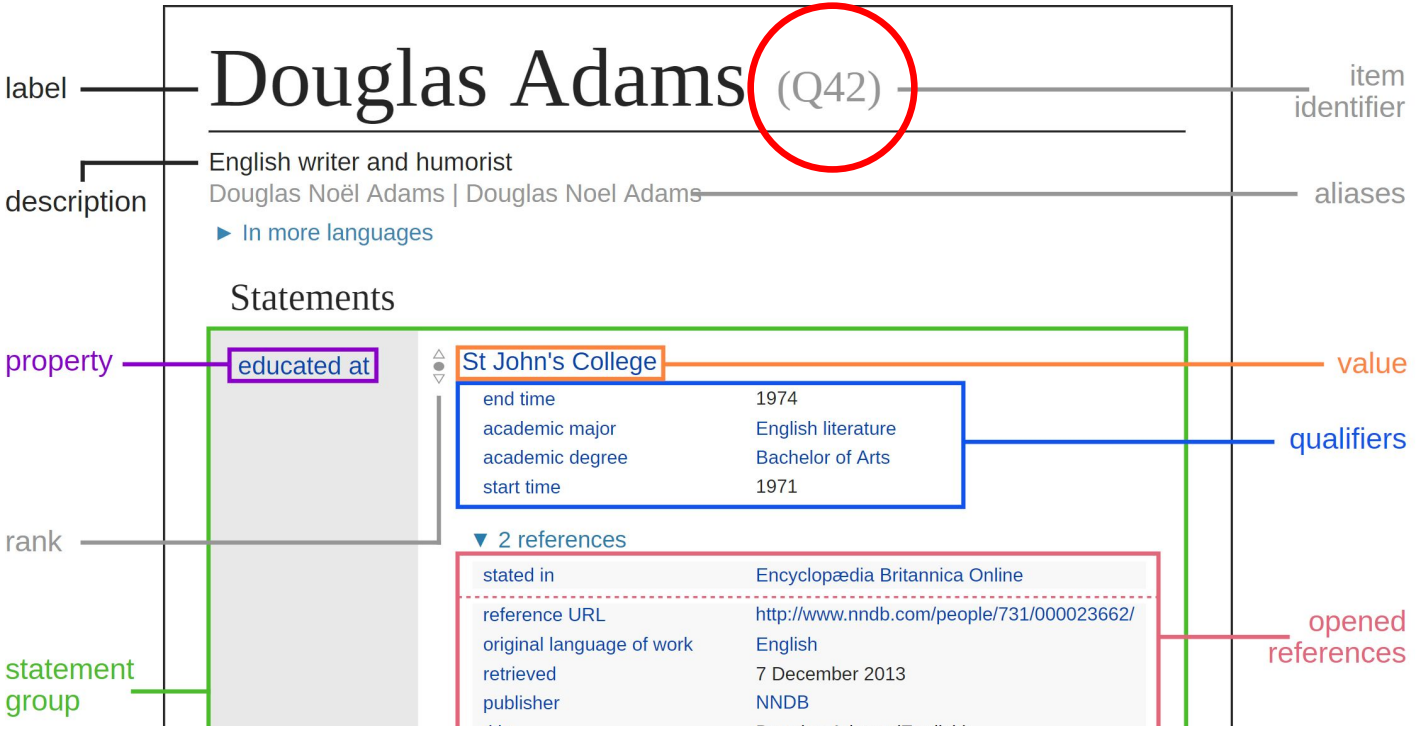
Wikibase / Wikidata data model

Wikidata = one of Wikibase instances

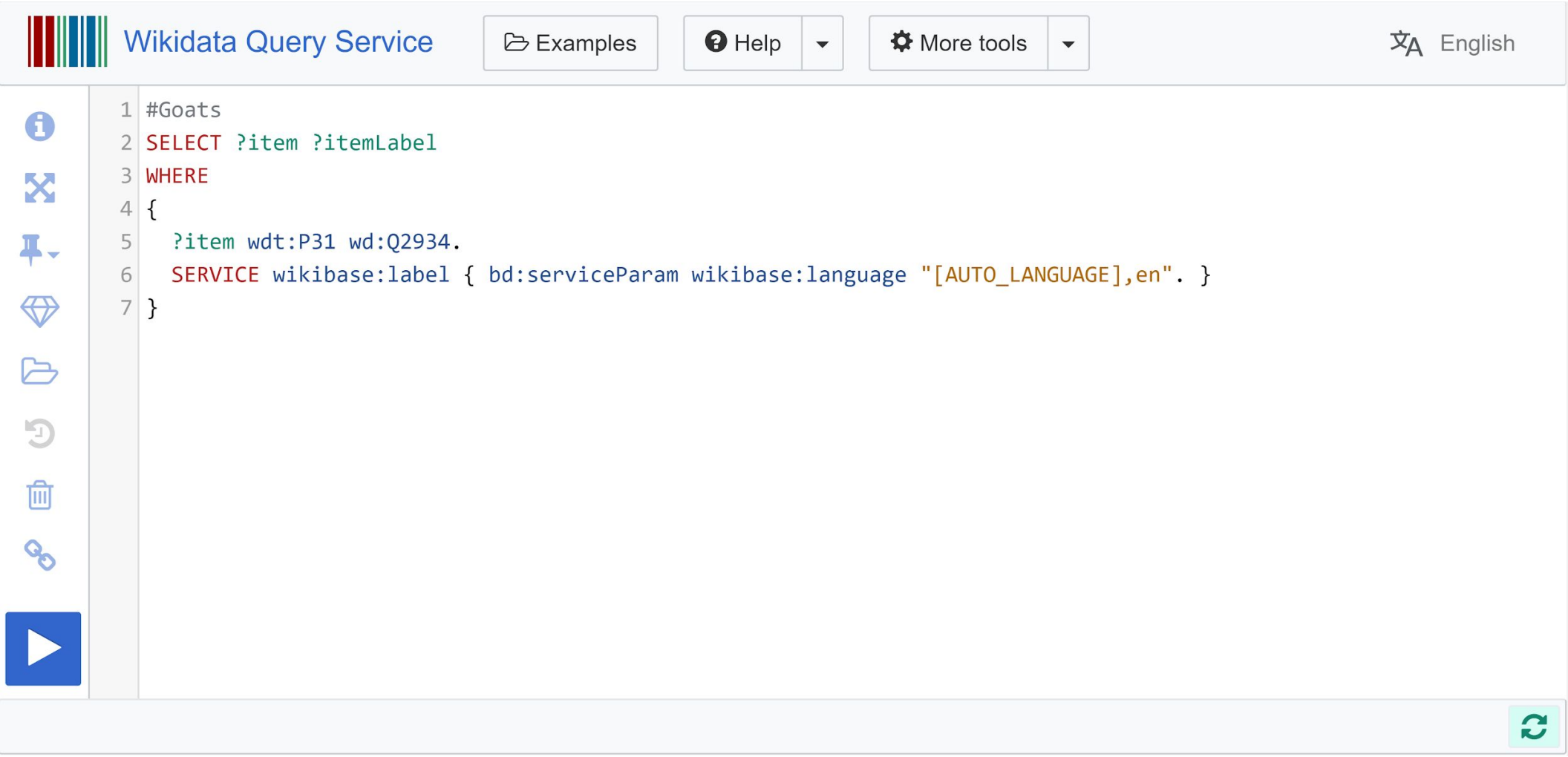




→ every info must have a reference


label
Douglas Adams
(Q42)
item identifier
description
English writer and humorist
Douglas Noël Adams | Douglas Noel Adams
aliases
► In more languages
Statements
property
educated at
St John's College
value
end time 1974
academic major English literature
academic degree Bachelor of Arts
start time 1971
qualifiers
rank
▼ 2 references
stated in Encyclopædia Britannica Online
reference URL http://www.nndb.com/people/731/000023662/
original language of work English
retrieved 7 December 2013
publisher NNDB
opened references
statement group
notable work
The Hitchhiker's Guide to the Galaxy pentalogy
▼ 1 reference
stated in Encyclopædia Britannica Online

https://query.wikidata.org/

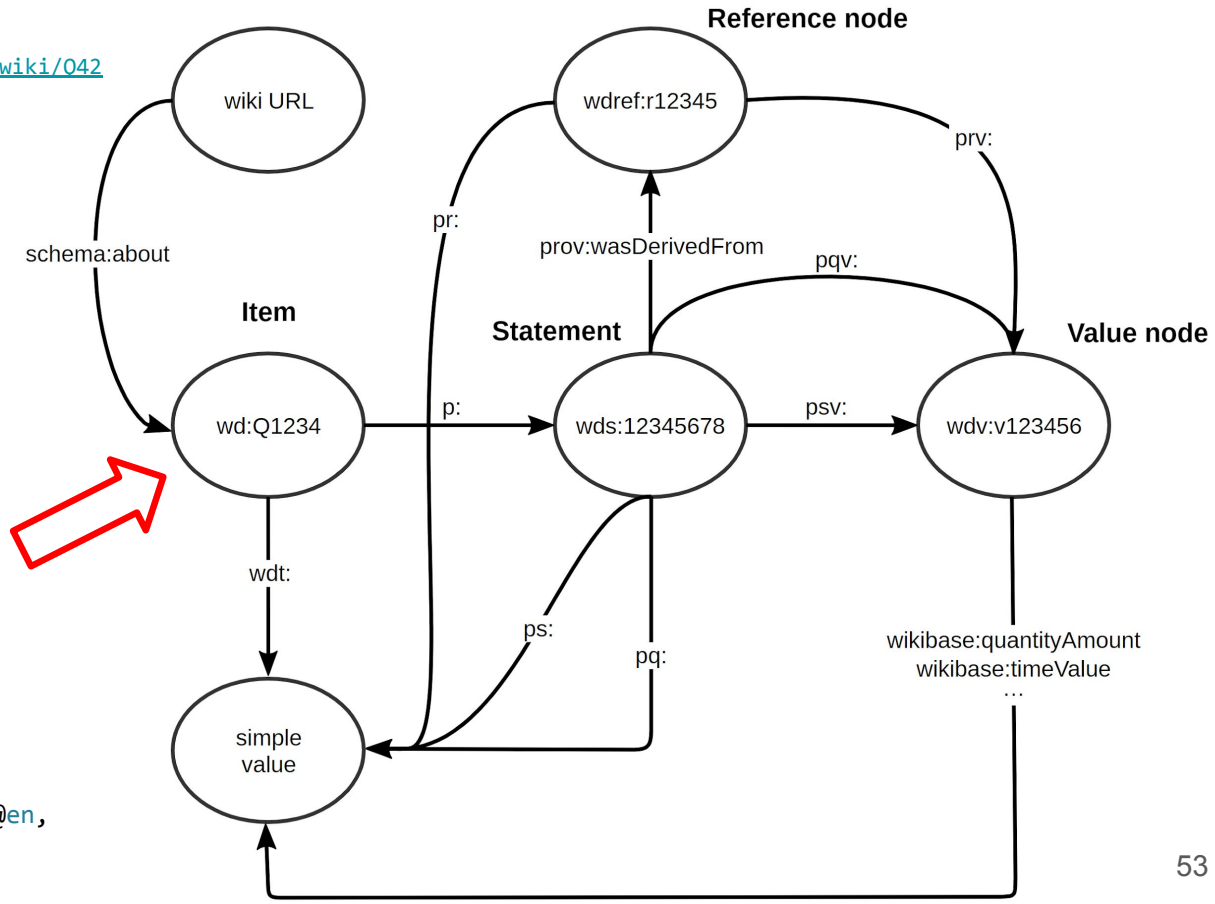


Wikidata RDF data model - QID, labels, descriptions, aliases

https://www.wikidata.org/wiki/Q42

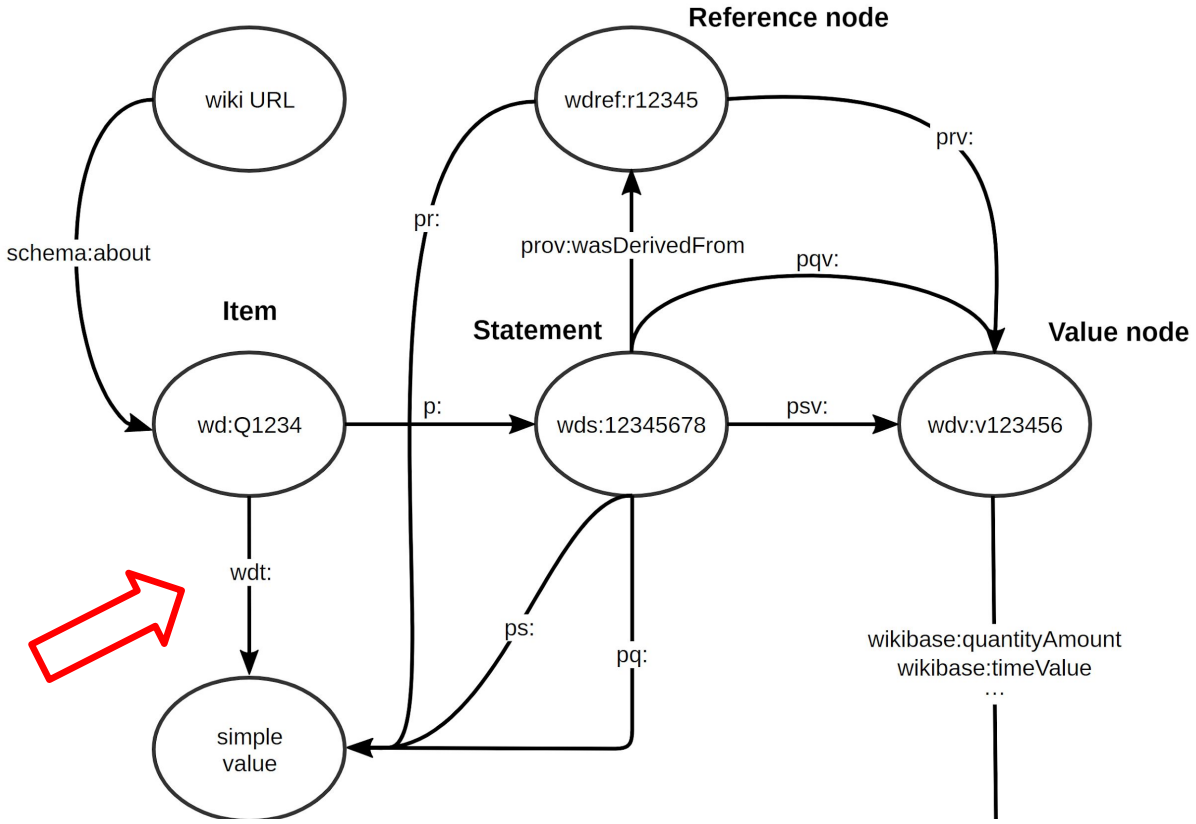
https://www.wikidata.org/wiki/Special:EntityData/Q42.ttl :

```
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wikibase: <http://wikiba.se/ontology#> .

wd:Q42 a wikibase:Item .
wd:Q42 rdfs:label "Douglas Adams"@en ;
    skos:prefLabel "Douglas Adams"@en ;
    schema:name "Douglas Adams"@en ;
    schema:name "ダグラス・アダムズ"@ja ;
    schema:name "ഡഗ്ലസ് ആഡംസ്"@ml ;
    ...
    skos:altLabel "Douglas Noel Adams"@en ;
    ...
    schema:description "English writer and humorist"@en,
    ...
```



Wikidata RDF data model - truthy values

```
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wikibase: <http://wikiba.se/ontology#> .

wd:Q42 a wikibase:Item .
wd:Q42 rdfs:label "Douglas Adams"@en ;
# P569 - date of birth
    wdt:P569 "1952-03-11T00:00:00Z"^^xsd:dateTime ;
    ...
```

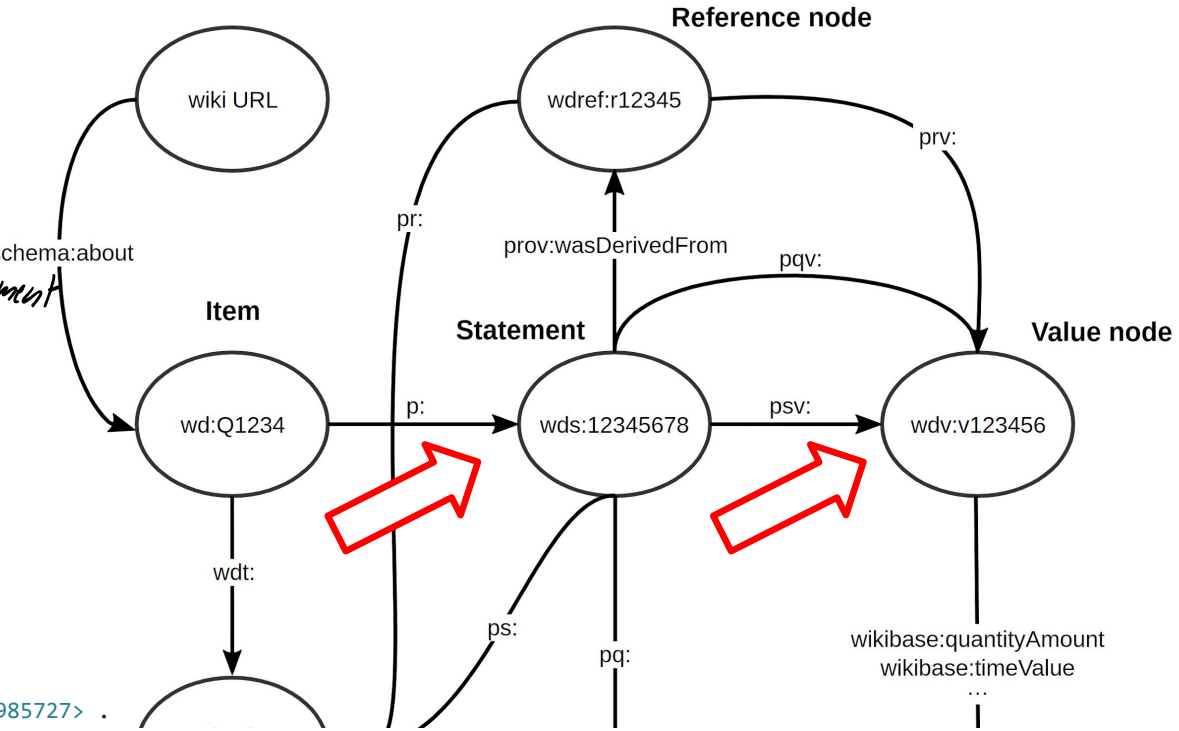


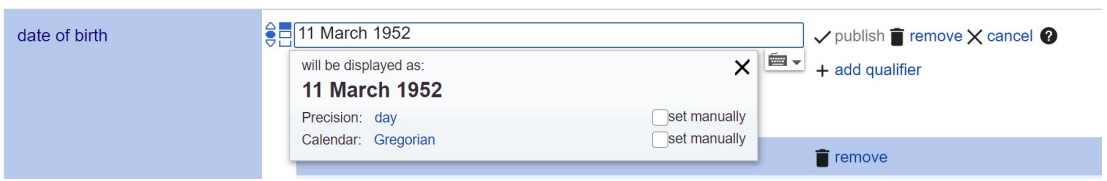
date of birth	11 March 1952

Wikidata RDF data model - statements

```
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wikibase: <http://wikiba.se/ontology#> .

wd:Q42 a wikibase:Item .
wd:Q42 rdfs:label "Douglas Adams"@en ;
# P569 - date of birth
       p:P569 s:q42-D8404CDA-25E4-4334-AF13-A3290BCD9C0F .

s:q42-D8404CDA-25E4-4334-AF13-A3290BCD9C0F a wikibase:Statement,
        wikibase:BestRank ;
    wikibase:rank wikibase:NormalRank ;
    ps:P569 "1952-03-11T00:00:00Z"^^xsd:dateTime ;
    psv:P569 v:426df9023763f08b066f4478480f44cd .

v:426df9023763f08b066f4478480f44cd a wikibase:TimeValue ;
    wikibase:timeValue "1952-03-11T00:00:00Z"^^xsd:dateTime ;
    wikibase:timePrecision "11"^^xsd:integer ;
    wikibase:timeTimezone "0"^^xsd:integer ;
    wikibase:timeCalendarModel <http://www.wikidata.org/entity/Q1985727> .
```

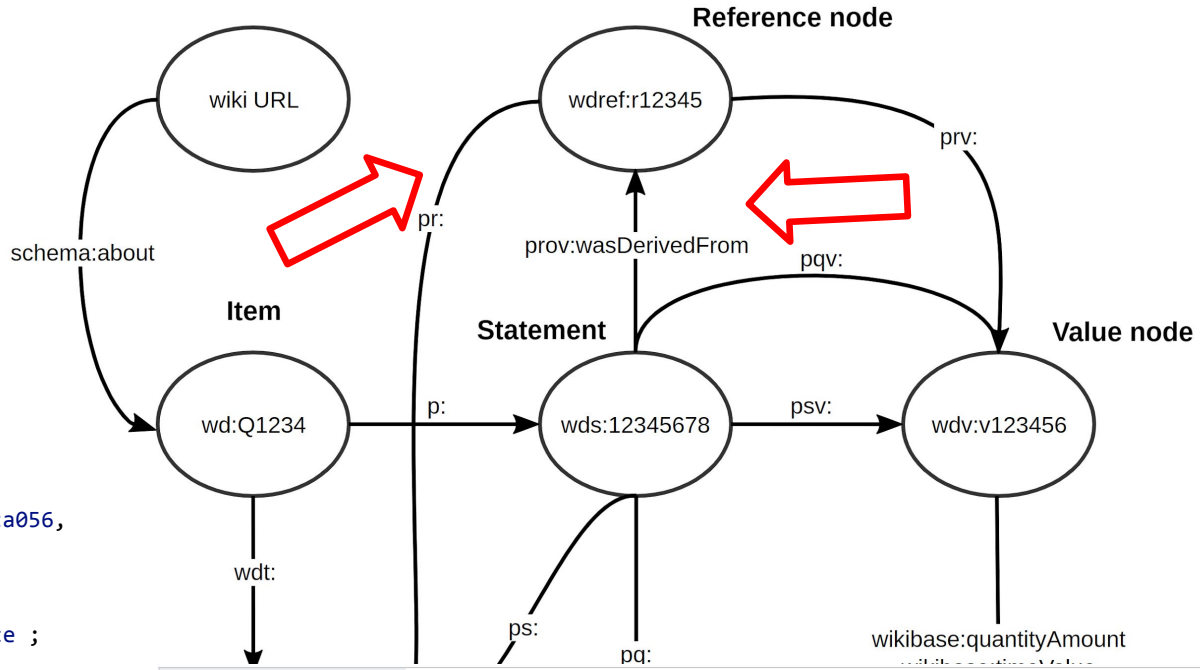
→ tohle je prostě guid na statement





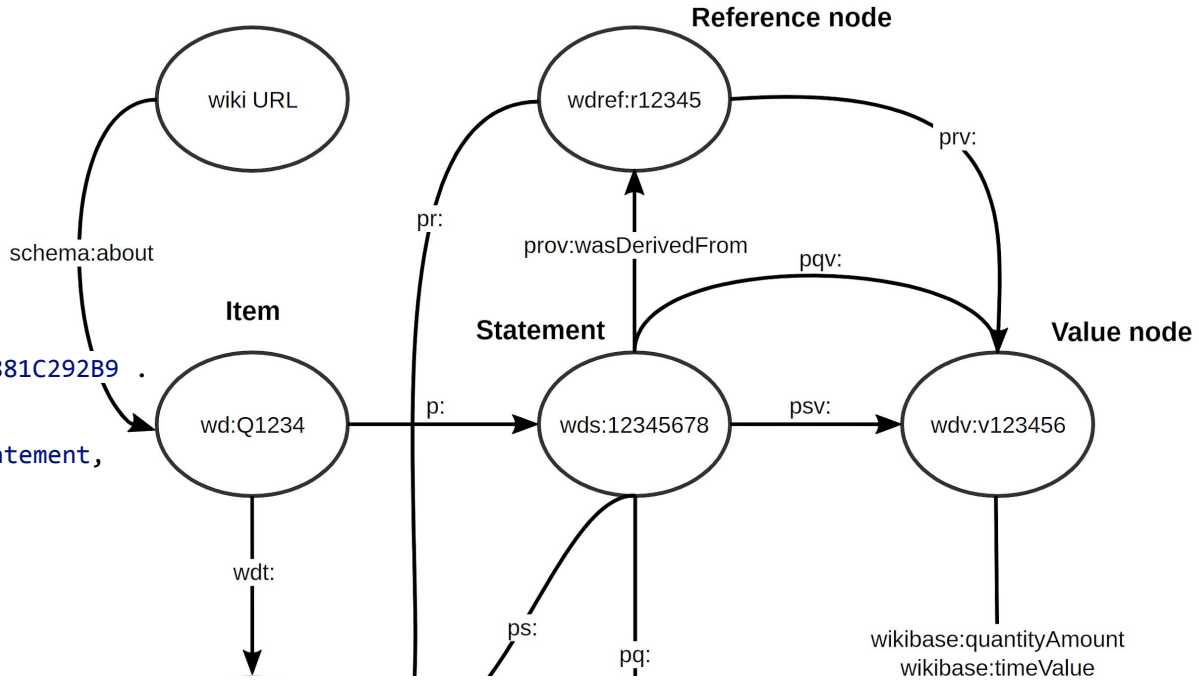
Wikidata RDF data model - references

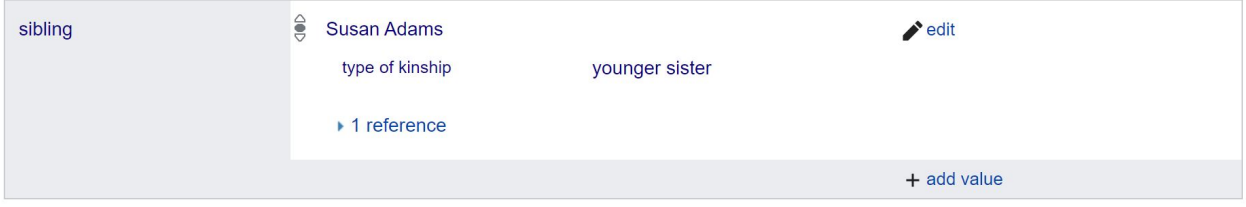
```
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wikibase: <http://wikiba.se/ontology#> .

wd:Q42 a wikibase:Item .
wd:Q42 rdfs:label "Douglas Adams"@en ;
# P569 - date of birth
       p:P569 s:q42-D8404CDA-25E4-4334-AF13-A3290BCD9C0F .

s:q42-D8404CDA-25E4-4334-AF13-A3290BCD9C0F a wikibase:Statement,
        wikibase:BestRank ;
    wikibase:rank wikibase:NormalRank ;
    ps:P569 "1952-03-11T00:00:00Z"^^xsd:dateTime ;
    psv:P569 v:426df9023763f08b066f4478480f44cd ;
    prov:wasDerivedFrom ref:355b56329b78db22be549dec34f2570ca61ca056,
        ...
        ref:a3feaf25fa95c4893bc1dc74ca6d884bc37c2723 .
ref:a3feaf25fa95c4893bc1dc74ca6d884bc37c2723 a wikibase:Reference ;
    #P248 - stated in
    pr:P248 wd:Q2877812 ;
    #P3630 - Babelio author ID
    pr:P3630 "2627" ;
    #P1810 - named as
    pr:P1810 "Douglas Adams" .
```



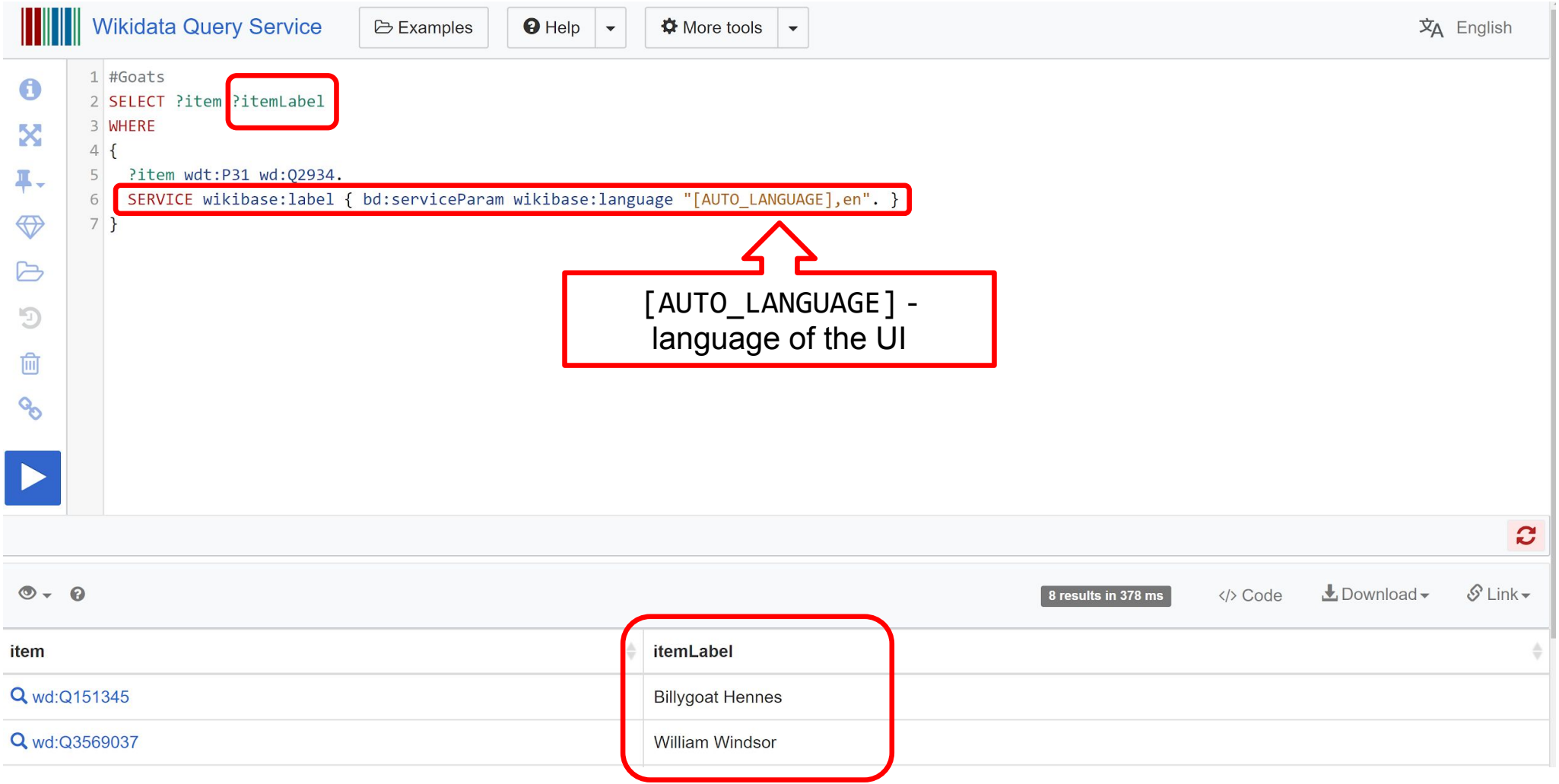
Wikidata RDF data model - qualifiers

```
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wikibase: <http://wikiba.se/ontology#> .

wd:Q42 a wikibase:Item .
wd:Q42 rdfs:label "Douglas Adams"@en ;
        #P3373 - sibling
        #Q14623673 - Susan Adams
        wdt:P3373 wd:Q14623673 ;
        wd:Q42 p:P3373 s:Q42-A3B1288B-67A9-4491-A3AA-20F881C292B9 .

s:Q42-A3B1288B-67A9-4491-A3AA-20F881C292B9 a wikibase:Statement,
        wikibase:BestRank ;
    wikibase:rank wikibase:NormalRank ;
    ps:P3373 wd:Q14623673 ;
    #P1039 - kinship to subject
    #Q10943095 - younger sister
    pq:P1039 wd:Q10943095 ;
    prov:wasDerivedFrom ref:6a363133c828f5c3cba3f33
.
```





https://query.wikidata.org/



Wikidata Query Service

Examples

Help

More tools






```
# Airports within 100km from Berlin
#defaultView:Map
SELECT ?place ?placeLabel ?location ?dist WHERE {
  # Berlin coordinates
  wd:Q64 wdt:P625 ?berlinLoc .
  SERVICE wikibase:around {
      ?place wdt:P625 ?location .
      bd:serviceParam wikibase:center ?berlinLoc .
      bd:serviceParam wikibase:radius "100" .
      bd:serviceParam wikibase:distance ?dist.
  }
  # Is an airport
  FILTER EXISTS { ?place wdt:P31/wdt:P279* wd:Q1248784 }
  SERVICE wikibase:label {
    bd:serviceParam wikibase:language "en" .
  }
} ORDER BY ASC(?dist)
```

Airports within 100km from Berlin

place	placeLabel	location	dist
wd:Q9686	Berlin Tempelhof Airport	Point(13.401666666 52.473611111)	4.946
wd:Q9688	Berlin Tegel Airport	Point(13.287778 52.559722)	8.042
wd:Q563799	Johannisthal Air Field	Point(13.5167 52.4333)	12.943
wd:Q9689	Berlin Schönefeld Airport	Point(13.520556 52.378611)	17.947
wd:Q160556	Berlin Brandenburg Airport	Point(13.500671666 52.362246666)	18.922
wd:Q20456666	Nauen Airport	Point(12.914167 52.626388)	33.971
wd:Q12693701	Lusse Airport	Point(12.669667 52.144167)	63.772
wd:Q12693460	Kyritz Airport	Point(12.425278 52.918888)	78.509
wd:Q35249408	Chojna	Point(14.4331 52.9427)	85.089
wd:Q12692538	Eisenhuttenstadt Airport	Point(14.585555 52.197222)	89.031

Airports within 100km from Berlin