

# Lecture 3

## Knowledge Graphs: Vocabularies & Ontologies

COMP 474/6741, Winter 2024

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

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## 1 Introduction

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## 2 RDF Schema

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## 3 Vocabularies

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## 4 Example: schema.org

[Example: schema.org](#)

## 5 Notes and Further Reading

[Notes and Further Reading](#)

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

## Slides Credit

- Includes slides from Jay Pujara & Sameer Singh, *Mining Knowledge Graphs from Text*, <https://kgtutorial.github.io/>
- Includes slides by Ivan Herman, W3C [Her]

## 1 Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## 2 RDF Schema

### Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

### RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

### Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

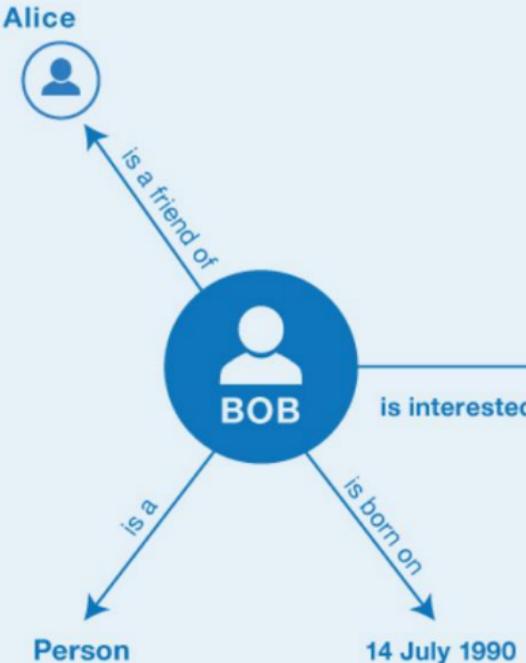
[Summary](#)

### Example: schema.org

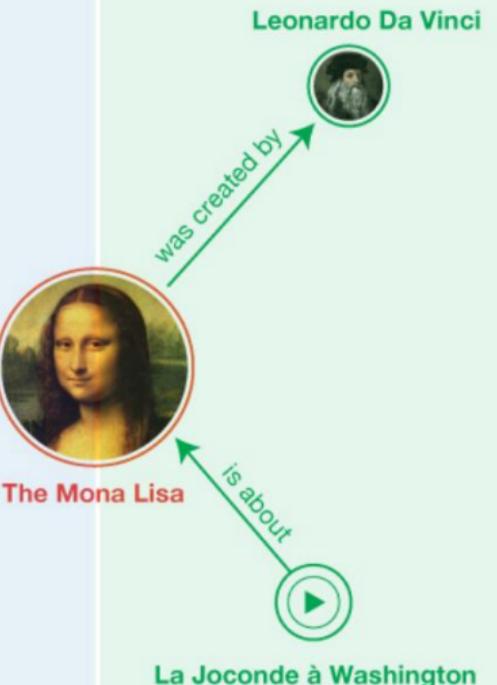
[Notes and Further Reading](#)

## 5 Notes and Further Reading

<http://example.org/bob>



<https://www.wikidata.org/wiki/Special:EntityData/Q12418>



## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

# Why knowledge graphs?

- Humans:

- Combat information overload
- Explore via intuitive structure
- Tool for supporting knowledge-driven tasks

- AIs:

- Key ingredient for many AI tasks
- Bridge from data to human semantics
- Use decades of work on graph analysis

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# RDF triples (cont.)

- ▶ An RDF Triple ( $s, p, o$ ) is such that:
  - “ $s$ ”, “ $p$ ” are URI-s, ie, resources on the Web; “ $o$ ” is a URI or a literal
    - “ $s$ ”, “ $p$ ”, and “ $o$ ” stand for “subject”, “property”, and “object”
  - here is the complete triple:

```
(<http://...isbn...6682>, <http://.../original>, <http://...isbn...409X>)
```

- ▶ RDF is a general model for such triples (with machine readable formats like RDF/XML, Turtle, N3, RDFa, Json, ...)

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

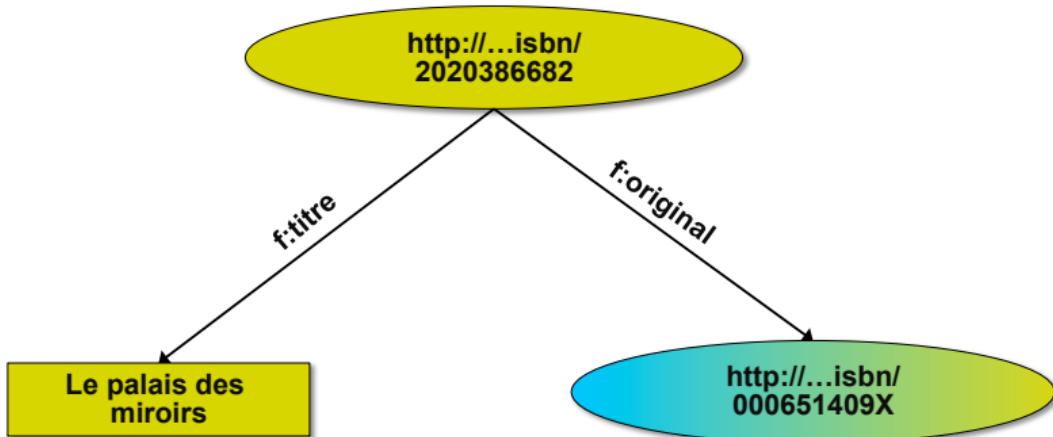
SKOS

Summary

Example: schema.org

Notes and Further Reading

# A simple RDF example (in Turtle)



```
<http://.../isbn/2020386682>
  f:titre "Le palais des miroirs"@fr ;
  f:original <http://.../isbn/000651409X> .
```

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

## Anatomy of a URI

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- A URI (*Uniform Resource Identifier*) uniquely identifies a resource (e.g., person, book, class of things) on the Web.
- A URI is not always a URL (*Uniform Resource Locator*)
  - URNs (*Uniform Resource Names*) are URIs that name resources without specifying how to retrieve them, e.g., urn:isbn:0451450523.
  - It's possible URLs are not available, e.g.,  
`http://www.concordia.ca/comp474/lecture03/slides5`  
is a valid URL, but nothing can be (currently?) retrieved from this address
- URIs have a generic syntax:



- Queries are also possible, following the format:

`scheme : [//authority]path[?query][#fragment]`

- Namespaces are used to shorten URIs and prevent name clashes, e.g., ex:me
- IRIs (*Internationalized Resource Identifiers*) are URIs with Unicode characters

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

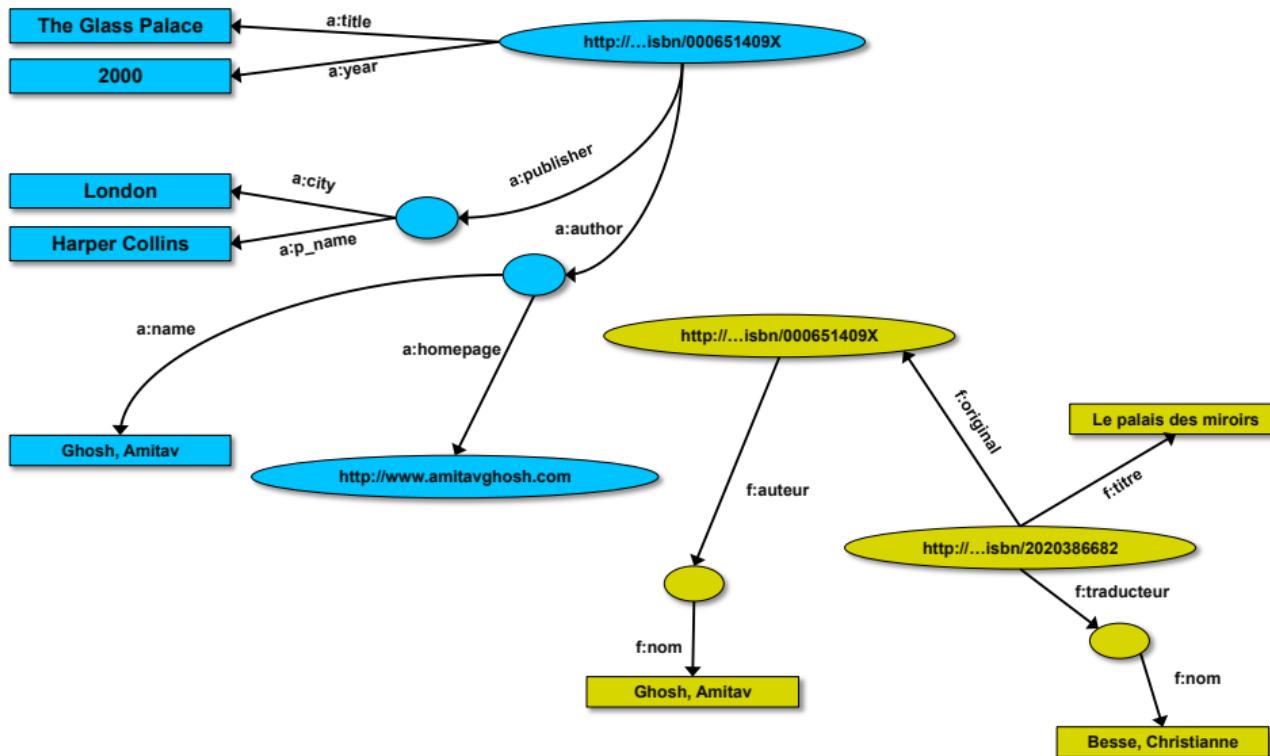
[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# 3<sup>rd</sup>: start merging your data

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## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

- Introduction
- Class and Instance
- Label & Comment
- Subclass
- Property
- RDFS Utility Vocabulary
- Summary

## Vocabularies

- Introduction
- FOAF
- Dublin Core
- SKOS
- Summary

Example: schema.org

Notes and Further Reading

# From the first week's lecture...

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## Common Issue

- Data in Information Silos  
Documents, databases,  
spreadsheets, emails, ...
- Disconnected, missing knowledge

## Knowledge Integration

- Connect silo-ed knowledge
- Leverage existing, external  
Knowledge Bases
- Freely available, many domains
- Continuously updated



WIKIDATA

Main page  
Community portal  
Project chat  
Create a new item  
Create a new lexeme  
Recent changes  
Random item  
Query Service  
Nearby  
Help  
Donate  
Tools  
What links here  
Related changes  
Special pages  
Permanent link  
Page information

Item Discussion

**support vector machine (Q282453)**

set of methods for supervised statistical learning  
SVM | support vector machines

► In more languages

**Statements**

Instance of algorithm  
0 references

subclass of supervised learning  
1 reference



Introduction

Review

Anatomy of a URI

Back to the bookstore  
example

RDF Schema

Introduction  
Class and Instance  
Label & Comment  
Subclass  
Property  
RDFS Utility Vocabulary  
Summary

Vocabularies

Introduction  
FOAF  
Dublin Core  
SKOS  
Summary

Example: schema.org

Notes and Further  
Reading

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

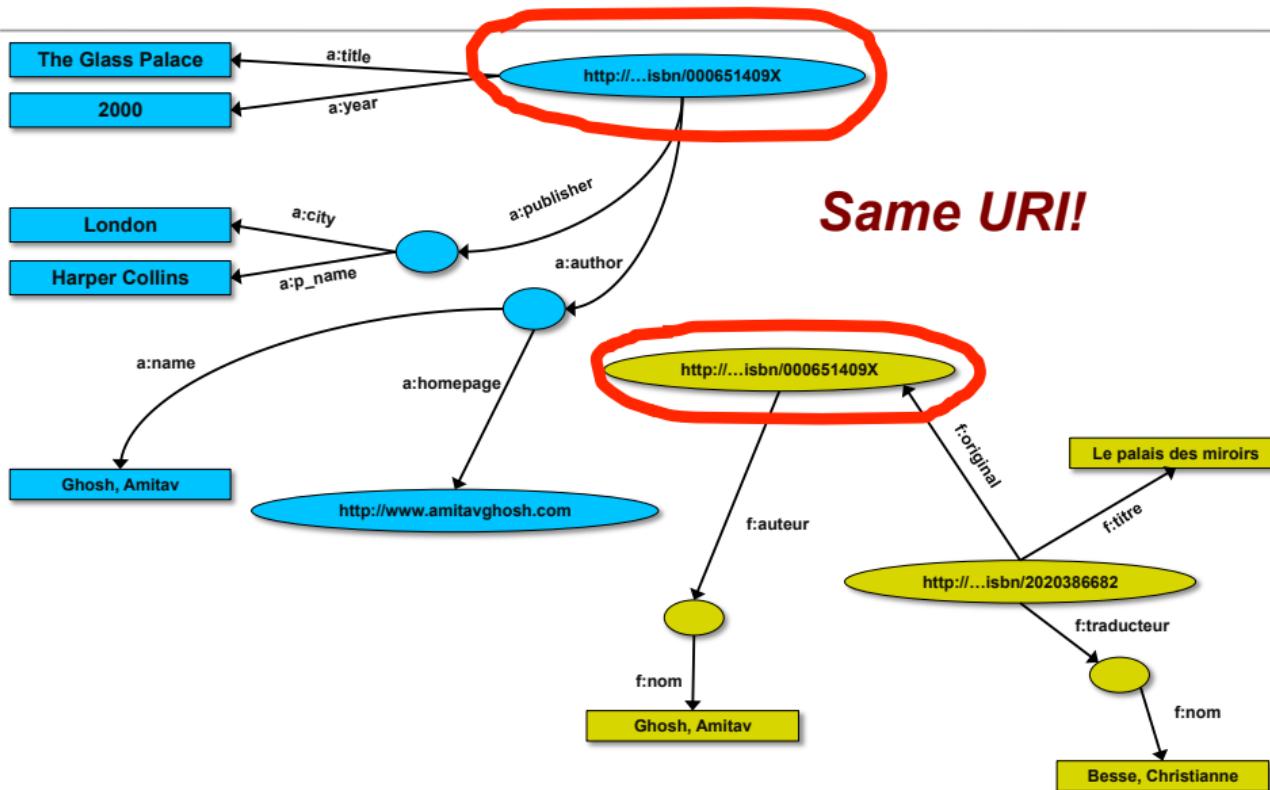
[Notes and Further Reading](#)



But: we do not want that!

# 3<sup>rd</sup>: start merging your data (cont)

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## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

- Introduction
- Class and Instance
- Label & Comment
- Subclass
- Property
- RDFS Utility Vocabulary
- Summary

## Vocabularies

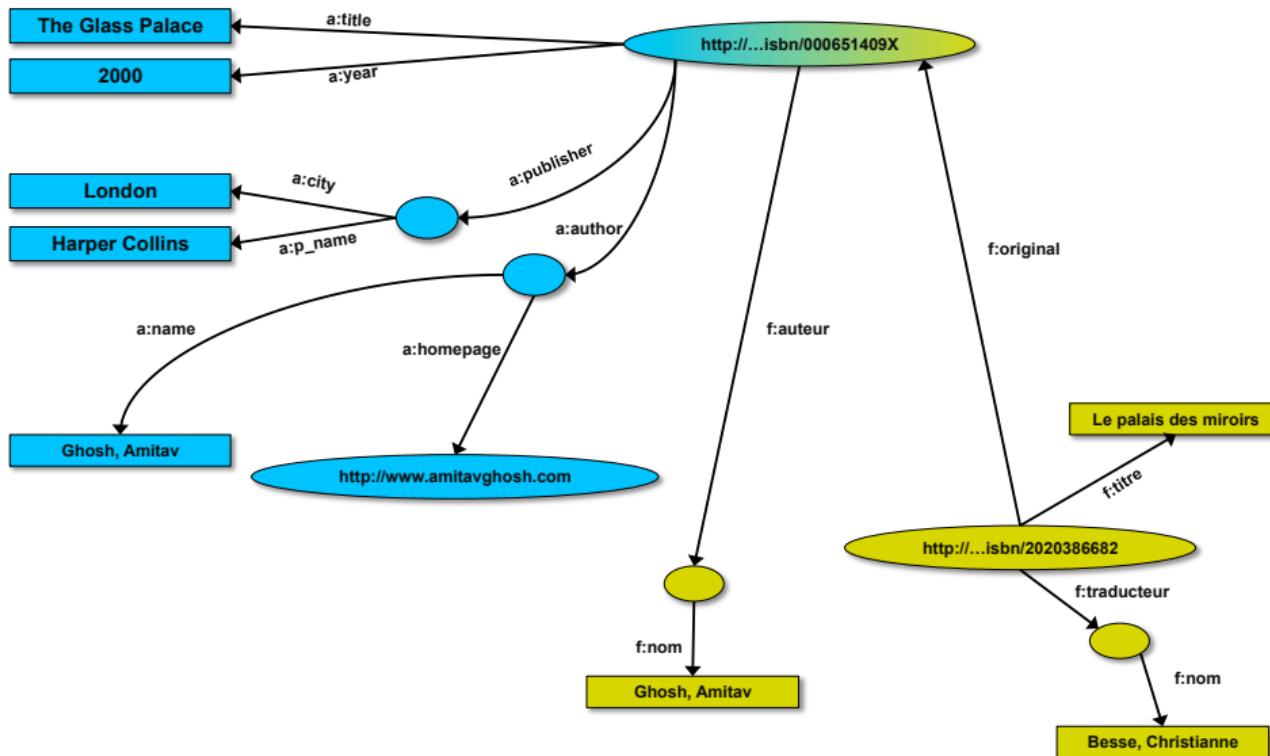
- Introduction
- FOAF
- Dublin Core
- SKOS
- Summary

Example: schema.org

Notes and Further Reading

# 3<sup>rd</sup>: start merging your data

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## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

- Introduction
- Class and Instance
- Label & Comment
- Subclass
- Property
- RDFS Utility Vocabulary
- Summary

## Vocabularies

- Introduction
- FOAF
- Dublin Core
- SKOS
- Summary

Example: schema.org

Notes and Further Reading

## What's an "author"?

- author
- auteur
- Autor
- book author
- writer
- editor
- ghostwriter
- co-author
- blogger
- ...

How can we define their meaning? And relations?

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

## Authors and publishers

Here are entered works on the relations between author and publisher.

### URI(s)

- <http://id.loc.gov/authorities/subjects/sh85010023>
- [info:lc/authorities/sh85010023](#)
- [http://id.loc.gov/authorities/sh85010023#concept](#)

### Instance Of

- MADS/RDF Topic
- MADS/RDF Authority
- SKOS Concept ↗

### Scheme Membership(s)

- [Library of Congress Subject Headings](#)

### Collection Membership(s)

- [LCSH Collection - Authorized Headings](#)
- [LCSH Collection - General Collection](#)
- [LCSH Collection - May Subdivide Geographically](#)

### Variants

- Author and publisher
- Authors and publishers--Law and legislation
- Publishers and authors
- Publishing contracts

### Broader Terms

- [Authorship](#)
- [Contracts](#)

### Narrower Terms

- [Queries \(Authorship\)](#)

### Related Terms

- [Book proposals](#)
- [Commission](#)

Everything



## Subject Of Works

243 resources

◀ Page 1 of 5 ▶

Alden, Chevy. How to get published, guaranteed  
Alden, Chevy. How to get published-guaranteed  
Allen, Marilyn. complete idiot's guide to book  
proposals & query letters

Allfeld, Philipp, 1852- gesetze betreffend das  
urheberrecht an werken der literatur und der  
tonkunst und über das verlagsrecht

Allfeld, Philipp, 1852- verlagsrecht

Allison, Alida. Grad student's guide to getting  
published

Amir, Nina, How to blog a book

Amir, Nina, author training manual

Amir, Nina. How to blog a book

Anderson, Rick, 1965- Scholarly communication

Anderson, Rick, 1965- Scholarly communication

Appelbaum, Judith. How to get happily published

Anneliemi, Judith. How to get happily published

Suggest Alternative Terminology

## Introduction

Review

Anatomy of a URI

Back to the bookstore  
example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further  
Reading

## RDF Triples (SKOS vocabulary, introduced later)

```
<http://id.loc.gov/authorities/subjects/sh85010023>
  <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
  <http://www.w3.org/2004/02/skos/core#Concept> .

<http://id.loc.gov/authorities/subjects/sh85010023>
  <http://www.w3.org/2004/02/skos/core#prefLabel>
  "Authors and publishers"@en .

<http://id.loc.gov/authorities/subjects/sh85010023>
  <http://www.w3.org/2004/02/skos/core#broader>
  <http://id.loc.gov/authorities/subjects/sh85031620> .

<http://id.loc.gov/authorities/subjects/sh85010023>
  <http://www.w3.org/2004/02/skos/core#narrower>
  <http://id.loc.gov/authorities/subjects/sh85109817> .

...
http://id.loc.gov/authorities/subjects/sh85010023.html
```

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)



*Photo credit "kxly", Flickr*

# TBL at TED on “The year open data went worldwide” (2010)

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A globe showing the Earth from space, with city lights visible, illustrating the global reach of open data.

F M A M J J A S O N D 2009

4.00 / 6.03

OpenStreetMap TED

Map data © OpenStreetMap contributors CC-BY-SA www.openstreetmap.org

CC BY SA

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

Tim Berners-Lee: The year open data went worldwide

<https://www.youtube.com/watch?v=3YcZ3Zqk0a8>

## 1 Introduction

Introduction

Review

Anatomy of a URI

Back to the bookstore example

## 2 RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

### RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

### Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

## 3 Vocabularies

## 4 Example: schema.org

## 5 Notes and Further Reading

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

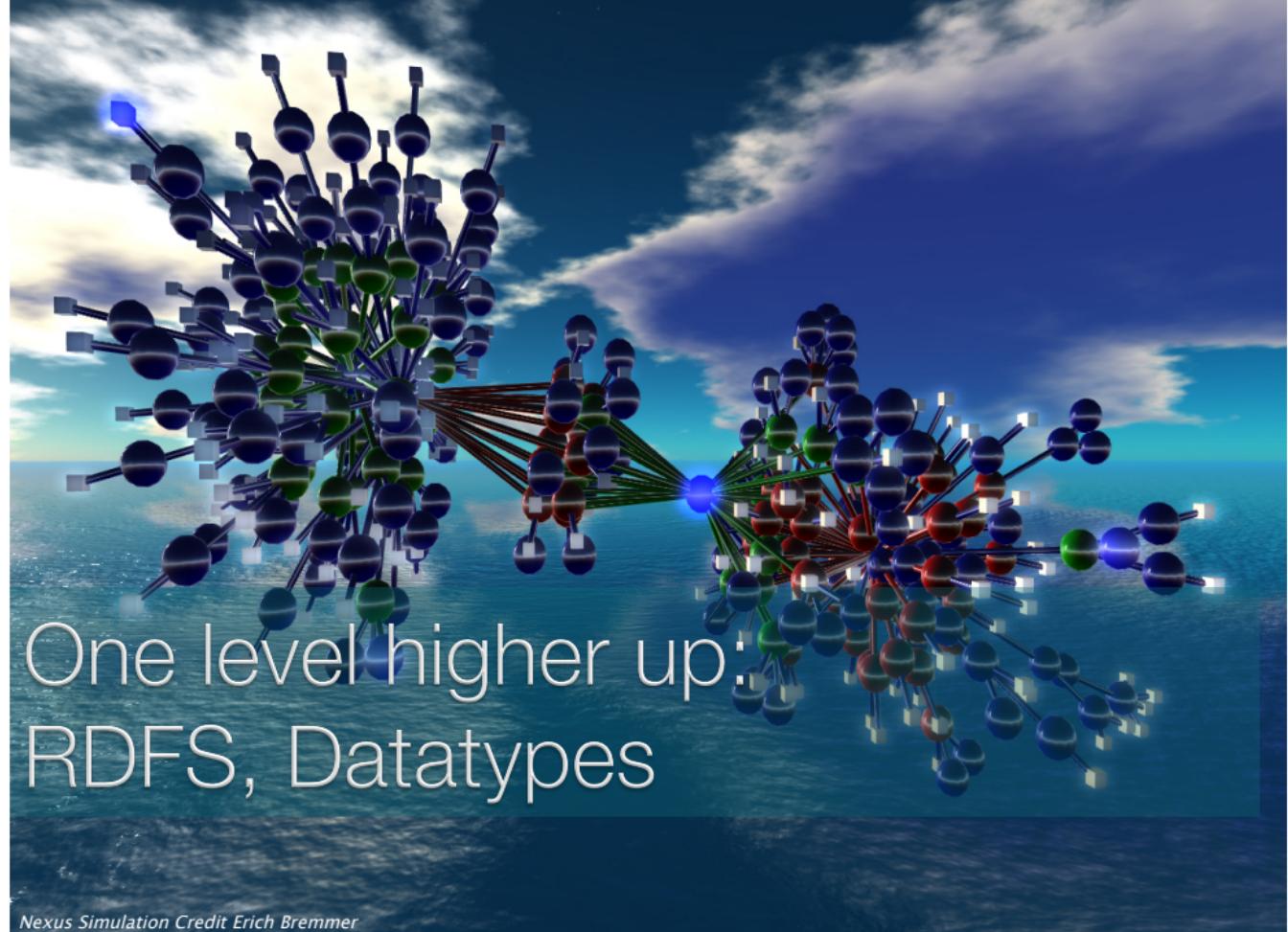
Dublin Core

SKOS

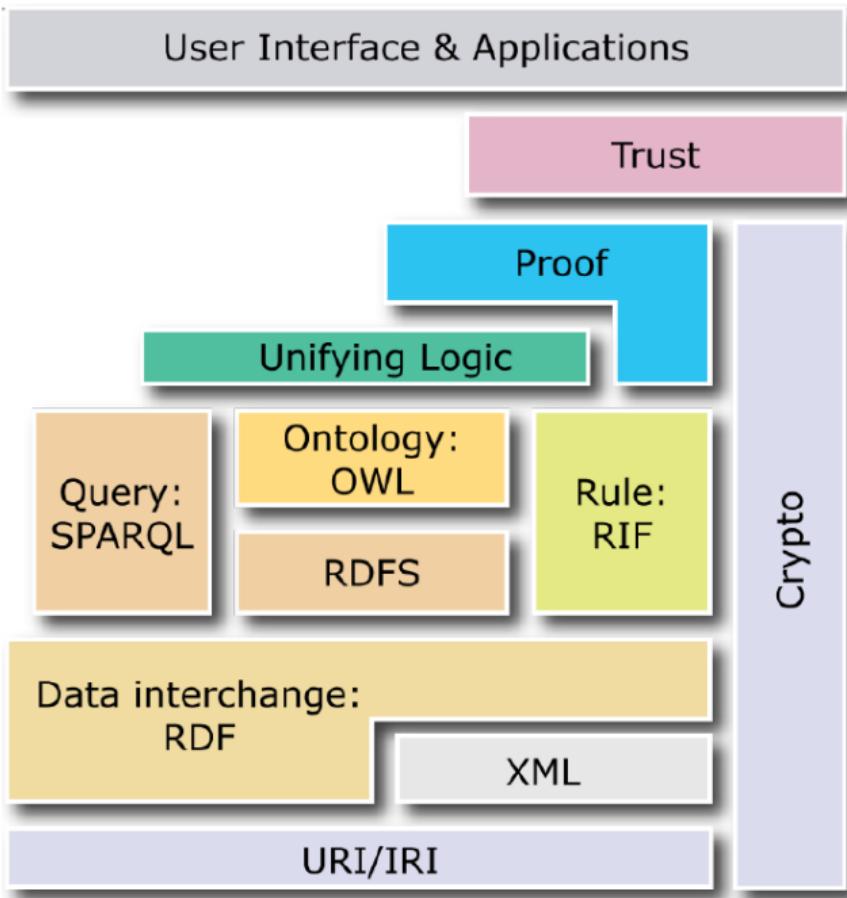
Summary

Example: schema.org

Notes and Further Reading



One level higher up:  
RDFS, Datatypes



[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## W3C Recommendation

- “RDF Vocabulary Description Language 1.0: RDF Schema” (RDFS 1.0)
- Current version (2014): “RDF Schema 1.1”

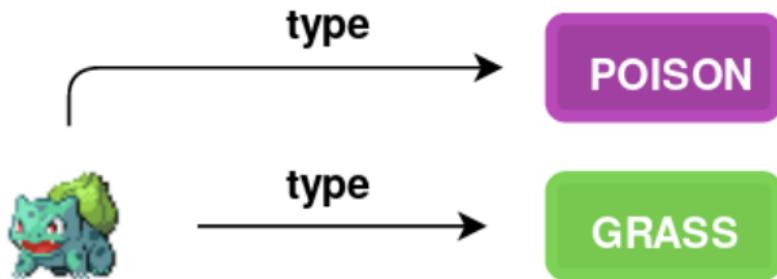
## Used together with RDF

- RDF provides “a way to make statements about resources” (IRIs)
- RDFS provides *semantics* about what the IRIs stand for  
(Schemas aka Vocabularies aka Ontologies aka . . . )

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

## Classes

- Resources may be divided into groups called **classes**
- The members of a class are known as **instances** of the class
- An instance can be member of **more than one class**



What is a knowledge graph – Pokémon edition: <https://pieterheyvaert.com/blog/2019/12/27/kg-pkmn/>

## Defining Classes

We define that an URI in a triple is a class using ... a triple!  
*(sounds weird the first time you hear it, but you get used to it)*

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

**Class and Instance**

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## Defining Classes

To define that **C** (a resource) is an RDFS `class`, write:

**C** `rdf:type rdfs:Class`

with `rdfs` defined as <http://www.w3.org/2000/01/rdf-schema#>

## Example

`ex:Novel rdf:type rdfs:Class`

## Turtle

In Turtle, `rdf:type` can be abbreviated as `a`

→ **Worksheet #2: Task 2**

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

**Class and Instance**

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## Instances

To define that **I** (a resource) is an instance of **C** (a class), write:

**I** `rdf:type C`

(or a instead of `rdf:type` in Turtle.)

## Example

`<http://...isbn/000651409X> rdf:type ex:Novel`

## Note

This is just another triple, so we can read both *data* and *schema* at run-time!

→ Worksheet #2: Task 3

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

**Class and Instance**

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

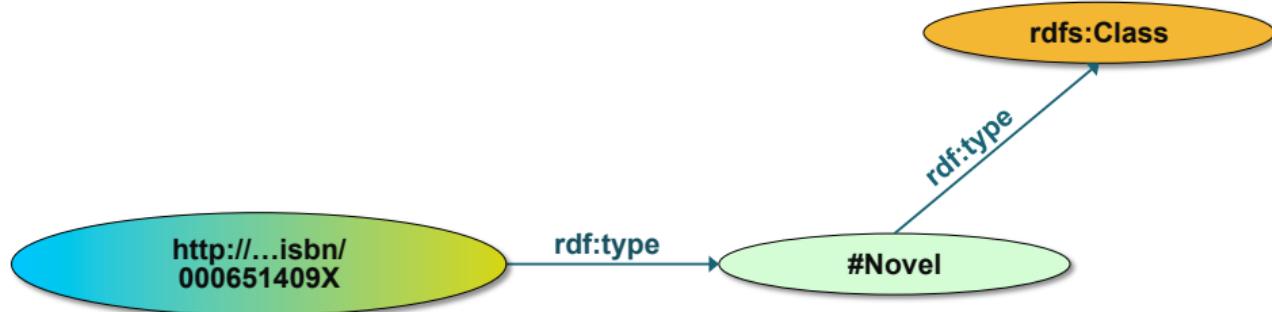
[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# Classes, resources in RDF(S)



- ▶ RDFS defines the meaning of these terms
  - (these are all special URI-s, we just use the namespace abbreviation)

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## Human-Readable Content

By convention, always provide:

`rdfs:label` a human-readable label

`rdfs:comment` a short (one paragraph) description

using language tags for multiple languages.

## Examples ([dbpedia:The\\_Glass\\_Palace](#))

```
<http://dbpedia.org/resource/The\_Glass\_Palace>
    rdfs:label      "The Glass Palace"@en ,
                    "Le Palais des miroirs"@fr ;
    rdfs:comment    "The Glass Palace is a 2000 historical novel..."@en ,
                    "Le Palais des miroirs est un roman..."@fr ;
```

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

→ **Worksheet #2: Task 4**

## Defining a subclass

To define that **C1** (a class) is a **subclass** of **C2** (a class), write:

**C1** *rdfs:subClassOf* **C2**

## Semantics

This states that all the instances of C1 are also instances of C2.

The *rdfs:subClassOf* property is **transitive**.

→ **Worksheet #2: Task 5**

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

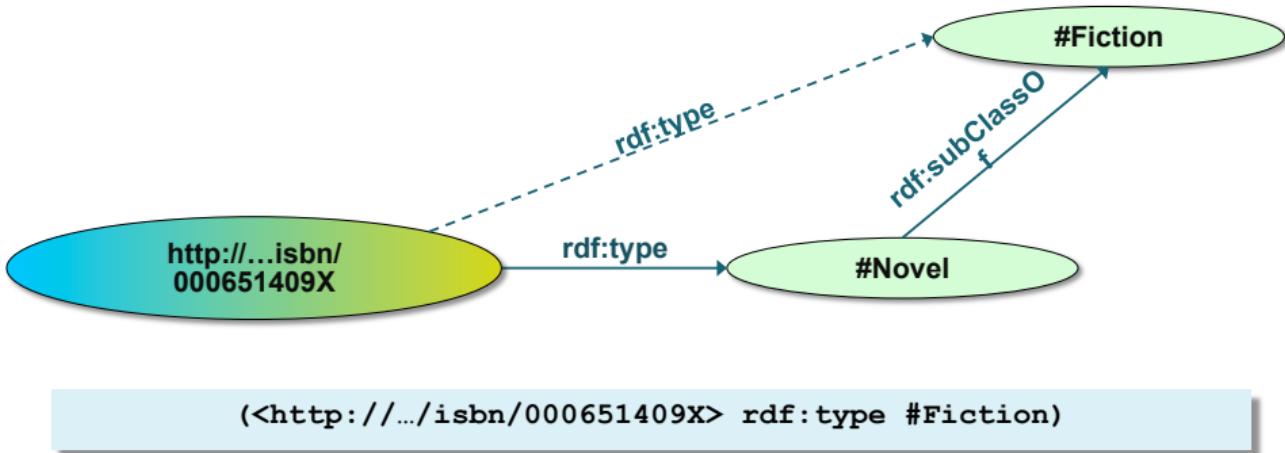
[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# Inferred properties



- ▶ is not in the original RDF data...
- ▶ ...but can be inferred from the RDFS rules
- ▶ RDFS environments return that triple, too

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

### Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

# Inference: let us be formal...

- ▶ The RDF Semantics document has a list of (33) entailment rules:
  - “if such and such triples are in the graph, add this and this”
  - do that recursively until the graph does not change
- ▶ The relevant rule for our example:

```
If:  
  uuu rdfs:subClassOf xxx .  
  vvv rdf:type uuu .  
Then add:  
  vvv rdf:type xxx .
```

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

## Example

```
<studies at> <type> <Property>
```

## Defining a Property

To define that **P** (a resource) is a **property**, write:

**P** *rdf:type rdf:Property*

Properties are used to define **relations** between subject resources and object resources.

→ Worksheet #2: Task 7

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

**Property**

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## Domain

To define a class **C** as the [domain](#) of a property **P**, write:

**P** [\*rdfs:domain\*](#) **C**

This states that resources denoted by the subjects of triples whose predicate is **P** are instances of the class **C**.

## Range

To define a class **C** as the [range](#) of a property **P**, write:

**P** [\*rdfs:range\*](#) **C**

This states that the resources denoted by the objects of triples whose predicate is **P** are instances of the class **C**.

## Note

- Properties are also resources (named with URIs)
- So we define properties of properties using... RDF properties!
- Again, you'll get used to it. . .

→ **Worksheet #2: Task 8**

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

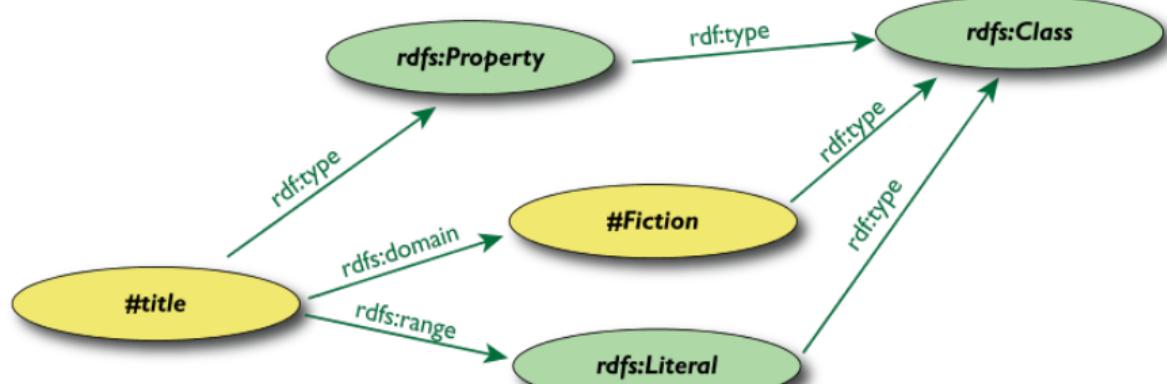
[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# Property specification example

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# Property specification serialized

## ► In RDF/XML:

```
<rdf:Property rdf:ID="title">
  <rdfs:domain rdf:resource="#Fiction"/>
  <rdfs:range rdf:resource="http://...#Literal"/>
</rdf:Property>
```

## ► In Turtle:

```
:title
  rdf:type    rdf:Property;
  rdfs:domain :Fiction;
  rdfs:range  rdfs:Literal.
```

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

## Defining a Subproperty

To define that **P1** (a property) is a **subproperty** of **P2** (a property), write:

**P1 rdfs:subPropertyOf P2**

With a subproperty, we can state that all resources related by one property are also related by another.

## Example

Like inheritance for classes, we can have inheritance for properties:

*<is father of> <subPropertyOf> <is parent of>*

## Some “helper” constructs

`rdfs:seeAlso` a property that links a resource to another for more information (can be in any format)

`rdfs:isDefinedBy` a property typically used to refer to a vocabulary (RDF Schema) defining the subject IRI

There are also some datastructures (bag, list etc.) – read more before using!



# RDF Schema Constructs: Summary

René Witte



## Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

Construct	Syntactic form	Description
<a href="#">Class</a> (a class)	<b>C</b> <code>rdf:type rdfs:Class</code>	<b>C</b> (a resource) is an RDF class
<a href="#">Property</a> (a class)	<b>P</b> <code>rdf:type rdf:Property</code>	<b>P</b> (a resource) is an RDF property
<a href="#">type</a> (a property)	<b>I</b> <code>rdf:type C</code>	<b>I</b> (a resource) is an instance of <b>C</b> (a class)
<a href="#">subClassOf</a> (a property)	<b>C1</b> <code>rdfs:subClassOf C2</code>	<b>C1</b> (a class) is a subclass of <b>C2</b> (a class)
<a href="#">subPropertyOf</a> (a property)	<b>P1</b> <code>rdfs:subPropertyOf P2</code>	<b>P1</b> (a property) is a sub-property of <b>P2</b> (a property)
<a href="#">domain</a> (a property)	<b>P</b> <code>rdfs:domain C</code>	domain of <b>P</b> (a property) is <b>C</b> (a class)
<a href="#">range</a> (a property)	<b>P</b> <code>rdfs:range C</code>	range of <b>P</b> (a property) is <b>C</b> (a class)

# Outline

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## 1 Introduction

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## 2 RDF Schema

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## 3 Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## 4 Example: schema.org

[Example: schema.org](#)

[Notes and Further Reading](#)

## 5 Notes and Further Reading

## Goal: Knowledge Integration

Two major principles:

① Reuse of vocabularies

E.g., always use FOAF to describe names, emails, etc., instead of making up your own schema

② Make your data self-describing

Embed metadata using RDF to ensure data can be understood and processed independently.

Adhering to these principles supports interoperability and semantic understanding across different systems.

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

## Provide useful information about new terms

For example, if we create our own proprietary term, like **SmallMediumEnterprise**, we could describe it as [HB11]:

```
1 @prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .  
2 @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .  
3 @prefix owl: <http://www.w3.org/2002/07/owl#> .  
4 @prefix co: <http://biglynx.co.uk/vocab/sme#> .  
5  
6 <http://biglynx.co.uk/vocab/sme#SmallMediumEnterprise>  
7   rdfs:type rdfs:Class ;  
8   rdfs:label "Small or Medium-sized Enterprise" ;  
9   rdfs:subClassOf <http://dbpedia.org/ontology/Company> .  
10  rdfs:subClassOf <http://umbel.org/umbel/sc/Business> ;  
11  rdfs:subClassOf <http://sw.opencyc.org/concept/Mx4rvVjQNpwpEbGdrcN5Y29ycA> ;  
12  rdfs:subClassOf <http://rdf.freebase.com/ns/m/0qb7t> .
```

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# Reuse vocabularies whenever possible

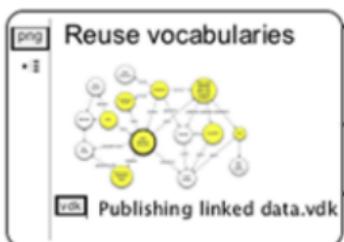
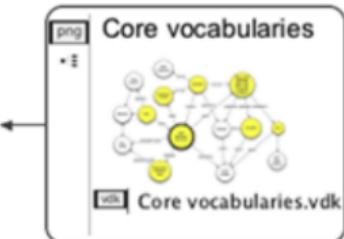
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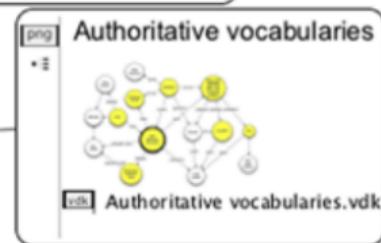
Use well-known and authoritative vocabularies to describe things whenever possible.



Describe common types of data by using terms from core vocabularies.



Use authoritative vocabularies for terms not defined by the core vocabularies.



Create your own vocabulary if necessary.



Use RDFS and OWL.



Be prepared to maintain it.

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

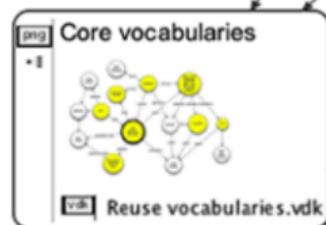
[Notes and Further Reading](#)

# Core Vocabularies

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Use terms from these core vocabularies to describe commonly understood data.



- ? Naming things? ← Use rdfs:label, foaf:name, skos:prefLabel.
- ? Describing people? ← Use FOAF, vCard.
- ? Describing addresses? ← Use vCard.
- ? Describing projects? ← Use Description of a Project (DOAP).
- ? Describing web pages and other publications? ← Use dc:creator and dc:description.
- ? Describing an RDF vocabulary? ← Use a VoID description.
- ? Describing existing taxonomies? ← Use SKOS.

- See also
- Authoritative vocabularies.vdk
- Links to core vocabularies
- DOAP
  - Dublin Core
  - FOAF
  - SKOS
  - vCard
  - VoID

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

# FOAF (Friend-of-a-Friend) Vocabulary

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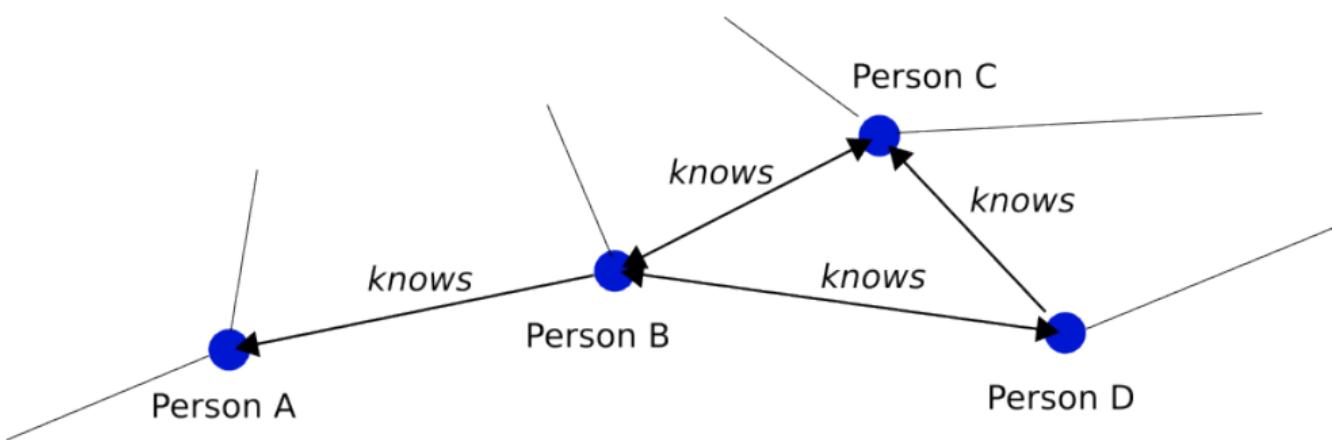
## FOAF

Model people and their connections in a social network.



```
@prefix foaf: <http://xmlns.com/foaf/0.1/>.
```

```
<http://example.org/joe> a foaf:Person ;  
    foaf:name "Joe_Doe" ;  
    foaf:mbox <mailto:joe.doe@example.com> .
```



→ Worksheet #2: Task 9

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

**FOAF**

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# Dublin Core® Metadata Initiative

Making it easier to find information.

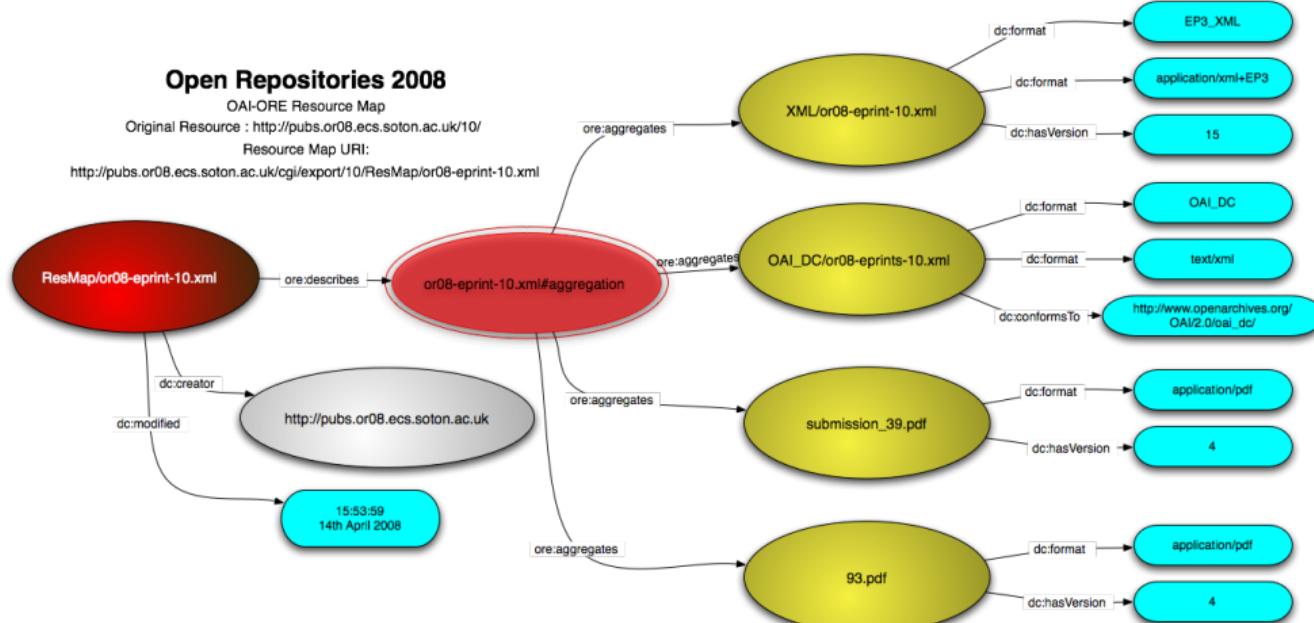
## Open Repositories 2008

OAI-ORE Resource Map

Original Resource : <http://pubs.or08.ecs.soton.ac.uk/10/>

Resource Map URI:

<http://pubs.or08.ecs.soton.ac.uk/cgi/export/10/ResMap/or08-eprint-10.xml>



Introduction

Review

Anatomy of a URI

Back to the bookstore example

RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

# Thesauri, glossaries (SKOS)

Photo credit "scarletgreen", Flickr

## Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# SKOS

---

- ▶ Represent and share classifications, glossaries, thesauri, etc
  - for example:
    - Dewey Decimal Classification, Art and Architecture Thesaurus, ACM classification of keywords and terms...
    - classification/formalization of Web 2.0 type tags
- ▶ Define classes and properties to add those structures to an RDF universe
  - allow for a quick port of this traditional data, combine it with other data

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# Example: the term “Fiction”, as defined by the Library of Congress

René Witte



Authorities & Vocabularies (Library of Congress): Fiction

http://id.loc.gov/authorities/sh85048050

Netvibes Feedly Social Private Mailing lists SW Python RDFa It! Bookmarks Add Zemanta bitly To Mendeley TinyURL To Faviki Dokuwiki

LIBRARY OF CONGRESS ASK A LIBRARIAN DIGITAL COLLECTIONS LIBRARY CATALOGS

The Library of Congress > Authorities & Vocabularies > Fiction

## Authorities & Vocabularies

[Return](#)

### Search

Enter search terms...

[Details](#) [Visualize](#)

### Fiction

**URI:** <<http://id.loc.gov/authorities/sh85048050#concept>>

**Type:** Topical Term

**Alternate Labels:** Fiction--Philosophy; Metafiction; Novellas (Short novels); Novels; Stories

**Broader Terms:**

- [Literature](#)
- [Prose literature](#)

**Narrower Terms:**

- [Adventure stories](#)
- [Allegories](#)
- [Alternative histories \(Fiction\)](#)
- [Bildungsromans](#)
- [Biographical fiction](#)

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

# Example: the term “Fiction”, as defined by the Library of Congress

René Witte



## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

The screenshot shows a web browser window with the URL <http://id.loc.gov/authorities/sh85048050>. The page title is "Authorities & Vocabularies (Library of Congress): Fiction". The main content area is titled "Authorities & Vocabularies" and shows the term "Fiction" highlighted with a red oval. Below it, the term's URI is listed as [<http://id.loc.gov/authorities/sh85048050#concept>](http://id.loc.gov/authorities/sh85048050#concept). The term is categorized as a "Topical Term". It has several "Alternate Labels": "Fiction--Philosophy; Metafiction; Novellas (Short novels); Novels; Stories". Under "Broader Terms", there are two items: "Literature" and "Prose literature". Under "Narrower Terms", there are five items: "Adventure stories", "Allegories", "Alternative histories (Fiction)", "Bildungsromans", and "Biographical fiction". At the bottom of the page, there are links for "Details" and "Visualize".

# Thesauri have identical structures...

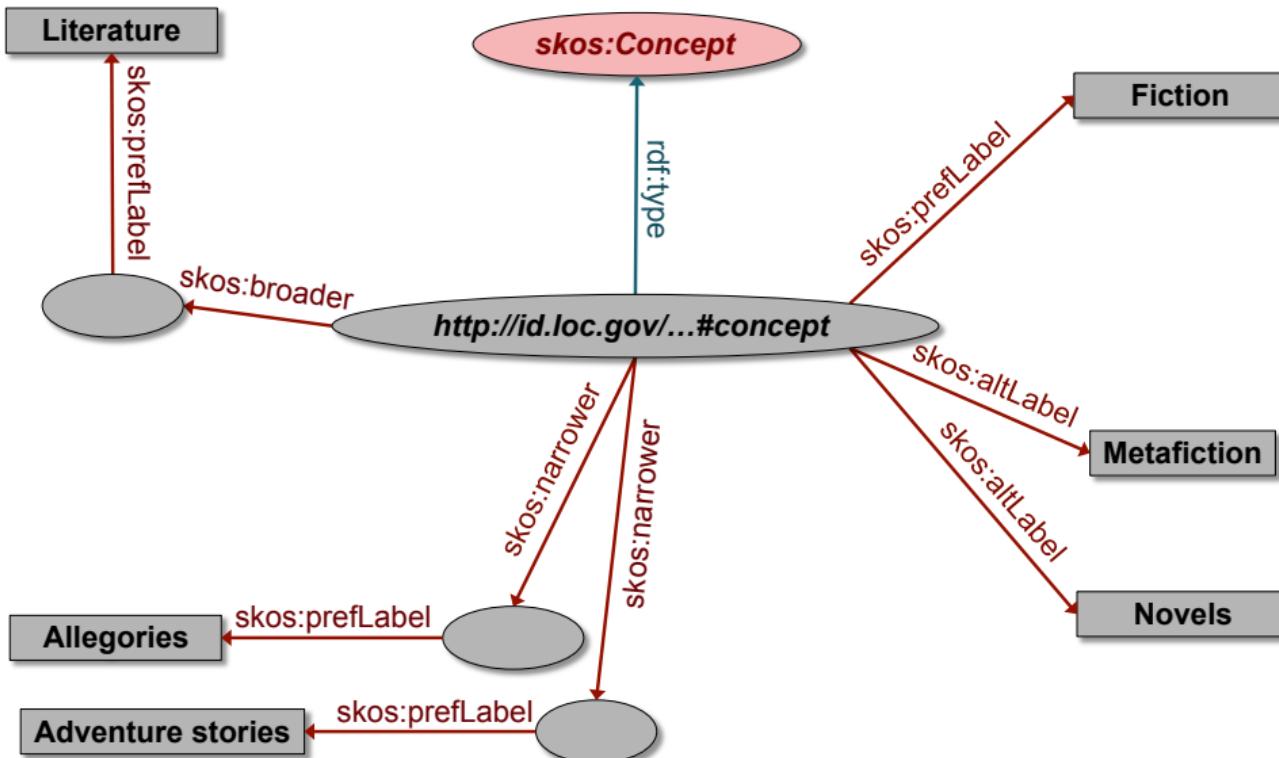
---

- ▶ The structure of the LOC page is fairly typical
  - label, alternate label, narrower, broader, ...
  - there is even an ISO standard for these
- ▶ SKOS provides a basic structure to create an RDF representation of these

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# LOC's “Fiction” in SKOS/RDF

René Witte



## Introduction

- Review
- Anatomy of a URI
- Back to the bookstore example

## RDF Schema

- Introduction
- Class and Instance
- Label & Comment
- Subclass
- Property
- RDFS Utility Vocabulary
- Summary

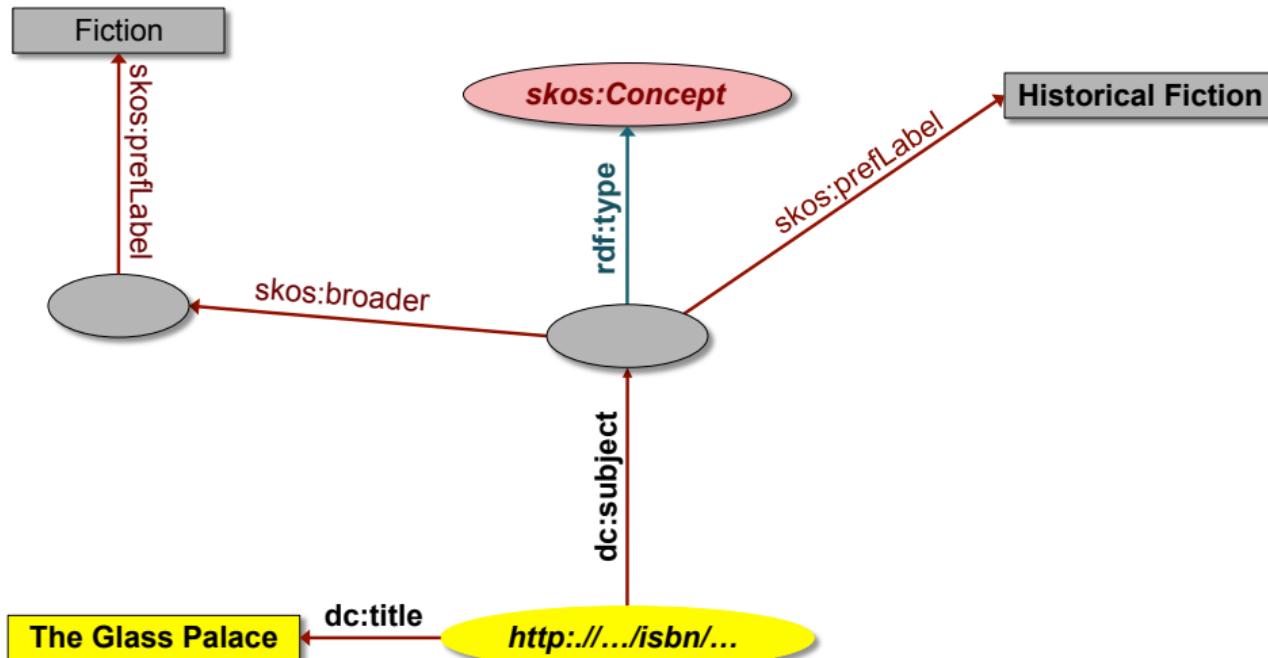
## Vocabularies

- Introduction
- FOAF
- Dublin Core
- SKOS
- Summary

## Example: schema.org

- Notes and Further Reading

# Usage of the LOC graph



[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# Same serialized

```
<http://.../isbn/000651409X>
  dc:title "The Glass Palace"@en;
  dc:subject <http://id.loc.gov/authorities/sh85061165#concept>;
  ...

<http://id.loc.gov/authorities/sh85061165#concept>
  a      skos:Concept;
  skos:prefLabel "Historical Fiction"@en;
  skos:broader <http://id.loc.gov/authorities/sh85048050#concept>;
  ...

<http://id.loc.gov/authorities/sh85048050#concept>
  a      skos:Concept;
  skos:prefLabel "Fiction"@en;
  skos:narrower <http://id.loc.gov/authorities/sh85061165#concept>;
  ...
```

## Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

[Example: schema.org](#)

[Notes and Further Reading](#)

# SKOS terms overview

## ► Classes and Properties:

- Basic description (Concept, ConceptScheme,...)
- Labeling (prefLabel, altLabel,...)
- Documentation (definition, historyNote,...)
- Semantic relations (broader, narrower, related,...)
- Collections (Collection, OrderedCollection,...)
- Concept mappings (broadMatch, narrowMatch,...)

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# Importance of SKOS

---

- ▶ SKOS provides a simple bridge between the “print world” and the (Semantic) Web
- ▶ Thesauri, glossaries, etc, from the library community can be made available
  - LOC is a good example
- ▶ SKOS can also be used to organize, eg, tags, annotate other vocabularies, ...

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# Importance of SKOS

- ▶ Anybody in the World can refer to common concepts
  - they mean the same for everybody
- ▶ Applications may exploit the relationships among concepts
  - eg, SPARQL queries may be issued on the library data+LOC

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

# More authoritative vocabularies

René Witte



Use these authoritative vocabularies to describe data you couldn't describe with the core vocabularies.

## Authoritative vocabularies



## Reuse vocabularies.vdk

### See also

## Core vocabularies.vdk

- Specifying the geographical location of something? ← Use Geo.
- Describing citations and bibliographic references? ← Use BIBO.
- Describing copyright licenses? ← Use the Creative Commons Rights Expression Language
- Describing a place? ← Use GeoNames.
- Describing product, price, or company data? ← Use Good Relations.
- Describing web resources that are compound digital objects? ← Use Object Reuse and Exchange.
- Describing information about an online community? ← Use SIOC.

### Links to authoritative vocabularies

- BIBO
- Creative Commons Rights Expression Language.
- Geo
- GeoNames
- Good Relations
- Object Reuse and Exchange
- SIOC

### Introduction

- Review
- Anatomy of a URI
- Back to the bookstore example

### RDF Schema

- Introduction
- Class and Instance
- Label & Comment
- Subclass
- Property
- RDFS Utility Vocabulary
- Summary

### Vocabularies

- Introduction
- FOAF
- Dublin Core
- SKOS
- Summary

### Example: schema.org

- Notes and Further Reading

# Outline

René Witte



## 1 Introduction

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## 2 RDF Schema

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## 3 Vocabularies

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## 4 Example: schema.org

[Example: schema.org](#)

## 5 Notes and Further Reading

[Notes and Further Reading](#)

# Typical usage of structured data

the artist movie – Google Search

[https://www.google.nl/#hl=en&sugexp=frgbld&gs\\_nf=1&cp=11&gs\\_id=50&xhr=t&q=the+artist+movie+database](https://www.google.nl/#hl=en&sugexp=frgbld&gs_nf=1&cp=11&gs_id=50&xhr=t&q=the+artist+movie+database)

Delicious LocalData TR 2012 My Mercurial Private Mailing lists Social SW Python RDFa It! Bookmarks To... Web Data Inspector

**Everything**

**The Artist** showtimes for Amsterdam

Pathé Tuschinski - Reguliersbreestraat 26-34, Amsterdam - Map  
11:50 - 14:05 - 19:10

Filmtheater "De Uitkijk" - Prinsengracht 452, Amsterdam - Map  
12:15 - 19:00 - 21:15

Filmtheater Rialto - Ceintuurbaan 338, Amsterdam - Map  
12:45

+ Show more theaters

**The Artist** (2011) - IMDb  
[www.imdb.com/title/tt165542/](http://www.imdb.com/title/tt165542/)  
Silent movie star George Valentin bemoans the coming era of talking ... Still of Jean Dujardin and Missi Pyle in **The Artist** Still of Bérénice Bejo in **The Artist** Reem ...  
→ Full cast and crew - **The Artist** Trailer (Official ... - Bérénice Bejo - Jean Dujardin

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Past week  
Past month  
Past year  
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**The Artist** (film) - Wikipedia, the free encyclopedia  
[en.wikipedia.org/wiki/The\\_Artist\\_\(film\)](http://en.wikipedia.org/wiki/The_Artist_(film))  
**The Artist** is a 2011 French romantic comedy drama in the style of a black-and-white silent film written and directed by Michel Hazanavicius, starring Jean ...  
→ Jean Dujardin - Bérénice Bejo - Uggie - Diegesis

**The Artist** Trailer 2011 HD - YouTube  
[www.youtube.com/watch?v=O8K9AzcSQJE](http://www.youtube.com/watch?v=O8K9AzcSQJE)  
 25 Aug 2011 - 3 min · Uploaded by TrailersApplecom  
I love how George Clooney, and Brad Pitt, lost the Best actor catogory to this film. It just shows that there is ...  
More videos for **the artist movie** \*

**Oscar 2012: The Artist, review - Telegraph**  
[www.telegraph.co.uk/Culture/Film/Film\\_reviews/news/7777777/Oscar-2012-The-Artist-review.html](http://www.telegraph.co.uk/Culture/Film/Film_reviews/news/7777777/Oscar-2012-The-Artist-review.html)  
★★★★★ Review by Robbie Collin  
27 Feb 2012 – **The Artist**, the final film to be released in 2011 and also the most heart-swellingly joyful movie in a silent movie, screened in black and white and ...

**The Artist** is the perfect film about Hollywood | Harvey Freeman

## Introduction

Review

Anatomy of a URI

Back to the bookstore example

## RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

## Vocabularies

Introduction

FOAF

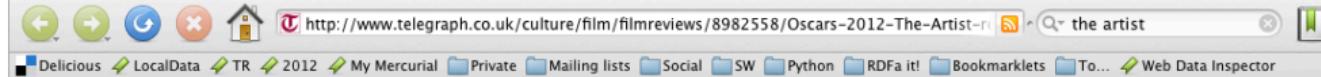
Dublin Core

SKOS

Summary

## Example: schema.org

Notes and Further Reading



# The Telegraph

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HOME > CULTURE > FILM > FILM REVIEWS

## Oscars 2012: The Artist, review

The Artist, an utterly beguiling silent, black-and-white celebration of early Hollywood won Best Picture at the Oscars 2012.

★★★★★



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### Introduction

Review

Anatomy of a URI

Back to the bookstore example

### RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

### Vocabularies

Introduction

FOAF

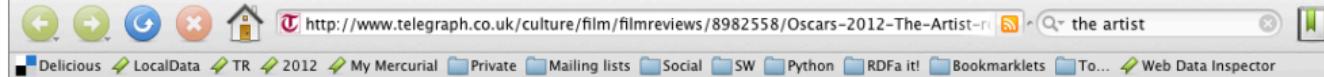
Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading



# The Telegraph

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HOME NEWS SPORT FINANCE COMMENT BLOGS CULTURE TRAVEL LIFESTYLE FASHION TECH

Film Music Art Books TV and Radio Theatre Hay Festival Dance Opera Photography Comedy Video In the Know

Oscars Film Reviews Cinema Trailers Coming Soon Talking Movies Interviews DVDs Film Life Film Video

HOME > CULTURE > FILM > FILM REVIEWS

## Oscars 2012: The Artist, review

The Artist, an utterly beguiling silent, black-and-white celebration of early Hollywood won Best Picture at the Oscars 2012.



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### Introduction

Review

Anatomy of a URI

Back to the bookstore example

### RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary

Summary

### Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading

**Introduction**

Review  
 Anatomy of a URI  
[Back to the bookstore example](#)

**RDF Schema**

Introduction  
 Class and Instance  
 Label & Comment  
 Subclass  
 Property  
 RDFS Utility Vocabulary  
[Summary](#)

**Vocabularies**

Introduction  
 FOAF  
 Dublin Core  
 SKOS  
[Summary](#)

**Example: schema.org**

Notes and Further Reading

Source of http://www.telegraph.co.uk/culture/film/filmreviews/8982558/Oscars-2012-The-Artist-review.html

Oscars 2012: The Artist, review – Telegraph

<http://www.telegraph.co.uk/culture/film/filmreviews/8982558/Oscars-2012-The-Artist-review.html>

The Telegraph

CULTURE TRAVEL LIFESTYLE FASHION TECH

Dating Offers Jobs

Monday 09 April 2012

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The Artist, review

**Osca**rs 2012: The Artist, review

**h1** itemprop="name">Oscars 2012: The Artist, review

**h2** itemprop="description">The Artist, an utterly beguiling silent, black-and-white celebration of early Hollywood won Best Picture at the Oscars. Hollywood won Best Picture at the Oscars 2012

**h2**

**div** class="rating" itemprop="reviewRating">**span** itemprop="ratingValue">1

**div** class="artIntro">**div** id="storyEmi... **div** class="slideshow ssIntro">**div** class="nextPrevLayer">**div** class="oneHalf gutter">**div** class="story">**div** class="cl">

The image shows a screenshot of a web browser displaying the Telegraph's review of "The Artist". The page includes the newspaper's masthead, navigation links for various sections like Culture, Travel, Lifestyle, Fashion, and Tech, and a sidebar for Dating, Offers, and Jobs. The main content is about the 2012 Oscar winner, with a large image of the film's lead actor, Jean Dujardin, in his iconic silent film costume. The page also features a green sidebar for INSEAD's Global Executive MBA program and a section for Telegraph tickets.

```

    <li class="first"><a href="/">Home</a><span>&raquo;</span></li>
    <li><a href="http://www.telegraph.co.uk/culture/">Culture</a><span>&raquo;</span></li>
        <li><a href="http://www.telegraph.co.uk/culture/film/">Film</a><span>&raquo;</span></li>
    <li class="styleSix"><a href="http://www.telegraph.co.uk/culture/film/filmreviews/">Film reviews</a></li>
</div>
<div class="cl"></div>

<!-- googleon: all -->
<div id="tmglBody" >
    <div class="access"><a name="article"></a></div>

    <div class="twoThirdsThird2 gutterUnder">
        <div class="twoThirds gutter" itemscope itemtype="http://schema.org/Review">
            <div class="storyHead">
                <h1 itemprop="name">Oscars 2012: The Artist, review</h1>
                <h2 itemprop="description">
                    The Artist, an utterly beguiling silent, black-and-white celebration of early Hollywood won Best Picture at the Oscars 2012.
                </h2>
                <div class="rating" itemprop="reviewRating" itemscope itemtype="http://schema.org/Rating">
                    <meta itemprop="worstRating" content = "0.5">
                    <meta itemprop="bestRating" content = "5">
                    <span itemprop="ratingValue" class="hidden">5</span>
                    
                </div>
                <div class="artIntro">
                    <div id="storyEmbSlide">
                        <div class="slideshow ssIntro">
                            <div class="nextPrevLayer">
                                <div class="ssImg">
                                    
                                <div class="artImageExtras" >
                                    <div class="imgCaptionCredit">
                                        <span class="caption">Bérénice Bejo as Rita in The Artist</span>
                                    </div>
                                </div>
                            </div>
                        </div>
                    </div>
                </div>
            </div>
        </div>
    <div class="oneHalf gutter">
        <div class="story">
            <div class="cl"></div>
        <!-- remove the whitespace added by escenic before end of </a> tag -->
    </div>
</div>

```

**Introduction**[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)**RDF Schema**[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)**Vocabularies**[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)**Example: schema.org**[Notes and Further Reading](#)

# In a slightly more readable format...

```
<div itemscope itemtype="http://schema.org/Review">
  ...
  <h1 itemprop="name">Oscars 2012: The Artist, review</h1>
  <h2 itemprop="description">The Artist, an utterly beguiling...</h2>
  ...
  <span itemprop="ratingValue" class="hidden">5</span>
  ...
```

## Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## Example: schema.org

[Notes and Further Reading](#)

# Yielding...

---

```
[ rdf:type schema:Review ,  
schema:name "Oscars 2012: The Artist, review" ,  
schema:description "The Artist, an utterly beguiling..." ,  
schema:ratingValue "5" ;  
...  
]
```

René Witte



## Introduction

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## RDF Schema

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## Vocabularies

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## Example: schema.org

[Notes and Further Reading](#)

# Outline

René Witte



## 1 Introduction

[Introduction](#)

[Review](#)

[Anatomy of a URI](#)

[Back to the bookstore example](#)

## 2 RDF Schema

[RDF Schema](#)

[Introduction](#)

[Class and Instance](#)

[Label & Comment](#)

[Subclass](#)

[Subclass](#)

[Property](#)

[RDFS Utility Vocabulary](#)

[Summary](#)

## 3 Vocabularies

[Vocabularies](#)

[Introduction](#)

[FOAF](#)

[Dublin Core](#)

[SKOS](#)

[Summary](#)

## 4 Example: schema.org

[Example: schema.org](#)

## 5 Notes and Further Reading

[Notes and Further Reading](#)

## Required

- [Yu14, Chapter 4] (RDFS)
- [Yu14, Chapter 7] (FOAF)

## Supplemental

- [Wor14] (RDF Primer)
- [Yu14, Chapter 10] (Schema.org)
- [WZRH14, Chapters 2, 4] (RDF, FOAF)

[Introduction](#)[Review](#)[Anatomy of a URI](#)[Back to the bookstore example](#)[RDF Schema](#)[Introduction](#)[Class and Instance](#)[Label & Comment](#)[Subclass](#)[Property](#)[RDFS Utility Vocabulary](#)[Summary](#)[Vocabularies](#)[Introduction](#)[FOAF](#)[Dublin Core](#)[SKOS](#)[Summary](#)[Example: schema.org](#)[Notes and Further Reading](#)

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René Witte



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<http://www.w3.org/People/Ivan/CorePresentations/RDFTutorial/>.
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Introduction

Review

Anatomy of a URI

Back to the bookstore example

RDF Schema

Introduction

Class and Instance

Label & Comment

Subclass

Property

RDFS Utility Vocabulary  
Summary

Vocabularies

Introduction

FOAF

Dublin Core

SKOS

Summary

Example: schema.org

Notes and Further Reading