

SENG 42273

Semantic web and Ontological Engineering

Lecture 4

RDF/XML

The Pattern of an RDF Document

```
1:  <rdf:Description rdf:resources="#resource-0">
2:    <someNameSpace:propertyName-0>
3:      <rdf:Description rdf:resource="#resource-1">
4:        <someNameSpace:propertyName-1>
5:          <rdf:Description rdf:resource="#resource-2">
6:            <someNameSpace:propertyName-2>
7:            ...
8:            </someNameSpace:propertyName-2>
9:          </rdf:Description>
10:         </someNameSpace:propertyName-1>
11:       </rdf:Description>
12:     </someNameSpace:propertyName-0>
13:   </rdf:Description>
```

Activity 01

```
<?xml version="1.0"?>

<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:cd="http://www.recshop.fake/cd#">

  <rdf:Description
    rdf:about="http://www.recshop.fake/cd/Empire Burlesque">
      <cd:artist>Bob Dylan</cd:artist>
      <cd:country>USA</cd:country>
      <cd:company>Columbia</cd:company>
      <cd:price>10.90</cd:price>
      <cd:year>1985</cd:year>
    </rdf:Description>

  </rdf:RDF>
```

Find RDF triples and draw the graph data model

Activity 02

Convert below data into RDF triples and validate them using <https://www.w3.org/RDF/Validator/>

Title	Artist	Country	Company	Price	Year
Empire Burlesque	Bob Dylan	USA	Columbia	10.90	1985
Hide your heart	Bonnie Tyler	UK	CBS Records	9.90	1988

Activity 03

```
<?xml version="1.0" encoding="UTF-8"?>

<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:region="http://www.country-regions.fake/">

    <rdf:Description rdf:about="http://en.wikipedia.org/wiki/Gampaha">
        <dc:title>Gampaha</dc:title>
        <dc:coverage>WP</dc:coverage>
        <dc:publisher>Wikipedia</dc:publisher>
        <region:population>20000</region:population>
        <region:principaltown rdf:resource="http://www.country-
            regions.fake/Gampaha"/>
    </rdf:Description>

</rdf:RDF>
```

- Identify the namespaces
- Identify the RDF triples (Subject, Predicate, Object)

Activity 04

Consider the following information about books in a library system:

- "*The Catcher in the Rye*" is authored by J.D. Salinger and was published in 1951.
- "*To Kill a Mockingbird*" is authored by Harper Lee and was published in 1960.
- "*1984*" is authored by George Orwell and was published in 1949.
- "*The Catcher in the Rye*" and "*To Kill a Mockingbird*" are categorized under Fiction.
- "*1984*" is categorized under Dystopian Fiction.

Convert the information into RDF triple.

RDF - AGGREGATION AND DISTRIBUTED INFORMATION

An RDF Document for a Resource

```
1: <?xml version="1.0"?>
2: <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
3:           xmlns:uom="http://www.standards.org/measurements#"
4:           xmlns="http://www.yuchen.net/photography/Camera#">
5:   <rdf:Description rdf:about="http://www.yuchen.net/rdf/
NikonD70.rdf#Nikon-D70">
6:     <rdf:type rdf:resource="http://www.yuchen.net/photography/
Camera#SLR"/>
7:     <weight>
8:       <rdf:Description>
9:         <rdf:value>1.4</rdf:value>
10:        <uom:units rdf:resource="http://www.something.org/
units#lbs"/>
11:      </rdf:Description>
12:    </weight>
13:  </rdf:Description>
14: </rdf:RDF>
```

RDF - AGGREGATION AND DISTRIBUTED INFORMATION

Another RDF Document for the Same Resource

```
1 <?xml version="1.0"?>
2 <!DOCTYPE rdf:RDF [ <!ENTITY xsd "http://www.w3.org/2001/
   XMLSchema#"> ]>
3 <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
4           xmlns:uom="http://www.standards.org/measurements#"
5           xmlns:yuchen="http://www.yuchen.net/photography/Camera#"
5           xmlns="http://www.yufriend.net/photography/Camera#">
6   <rdf:Description rdf:about="http://www.yuchen.net/rdf/
      NikonD70.rdf#Nikon-D70">
7     <rdf:type rdf:resource="&yuchen;SLR"/>
8     <minSensitivity rdf:datatype="&xsd;integer">200
     </minSensitivity>
9     <maxSensitivity rdf:datatype="&xsd;integer">1600
     </maxSensitivity>
10    </rdf:Description>
11  </rdf:RDF>
```

RDF - AGGREGATION AND DISTRIBUTED INFORMATION

A New RDF Document Generated by Combining Two RDF Documents

```
1 <?xml version="1.0"?>
2 <!DOCTYPE rdf:RDF [ <!ENTITY xsd "http://www.w3.org/2001/
   XMLSchema#"> ]>
3 <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
4       xmlns:uom="http://www.standards.org/measurements#"
5       xmlns:newp="http://www.yufriend.net/photography/Camera#"
6       xmlns="http://www.yuchen.net/photography/Camera#">
7   <rdf:Description rdf:about="http://www.yuchen.net/rdf/
      NikonD70.rdf#Nikon-D70">
8     <rdf:type rdf:resource="http://www.yuchen.net/photography/
      Camera#SLR"/>
9     <weight>
10    <rdf:Description>
11      <rdf:value rdf:datatype="&xsd;decimal">1.4</rdf:value>
12      <uom:units rdf:resource="http://www.something.org/
         units#lbs"/>
13    </rdf:Description>
14  </weight>
15  <newp:minSensitivity rdf:datatype="&xsd;integer">200</newp:
      minSensitivity>
16  <newp:maxSensitivity rdf:datatype="&xsd;integer">1600</newp:
      maxSensitivity>
17 </rdf:Description>
18 </rdf:RDF>
```

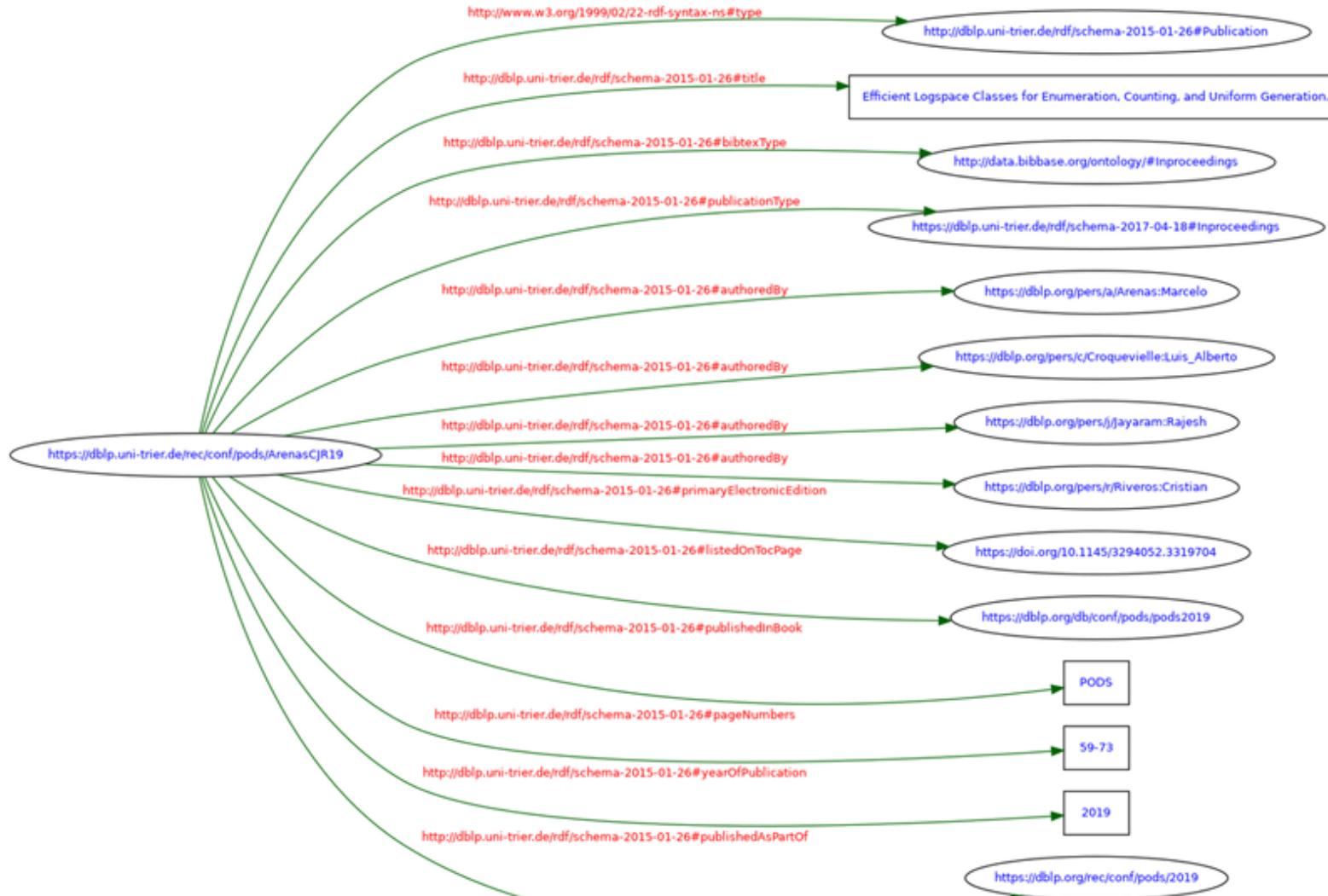
Resource Description Framework(RDF)

Real World Example: DBLP data, a computer science bibliography website. Starting in 1993 at the University of Trier, Germany. (<https://dblp.uni-trier.de/>)

```
--<rdf:RDF>
--<dblp:Publication rdf:about="https://dblp.uni-trier.de/rec/conf/pods/ArenasCJR19">
  <owl:sameAs rdf:resource="https://dblp.org/rec/conf/pods/ArenasCJR19"/>
</dblp:Publication>
--<dblp:Publication rdf:about="https://dblp.org/rec/conf/pods/ArenasCJR19">
  <owl:sameAs rdf:resource="https://doi.org/10.1145/3294052.3319704"/>
--<dblp:title>
  Efficient Logspace Classes for Enumeration, Counting, and Uniform Generation.
</dblp:title>
<dblp:bibtexType rdf:resource="http://data.bibbase.org/ontology/#Inproceedings"/>
<dblp:publicationType rdf:resource="https://dblp.uni-trier.de/rdf/schema-2017-04-18#Inproceedings"/>
<dblp:authoredBy rdf:resource="https://dblp.org/pers/a/Arenas:Marcelo"/>
<dblp:authoredBy rdf:resource="https://dblp.org/pers/c/Croquevielle:Luis_Alberto"/>
<dblp:authoredBy rdf:resource="https://dblp.org/pers/j/Jayaram:Rajesh"/>
<dblp:authoredBy rdf:resource="https://dblp.org/pers/r/Riveros:Cristian"/>
<dblp:primaryElectronicEdition rdf:resource="https://doi.org/10.1145/3294052.3319704"/>
<dblp:listedOnTocPage rdf:resource="https://dblp.org/db/conf/pods/pods2019"/>
<dblp:publishedInBook>PODS</dblp:publishedInBook>
<dblp:pageNumbers>59-73</dblp:pageNumbers>
<dblp:yearOfPublication>2019</dblp:yearOfPublication>
<dblp:publishedAsPartOf rdf:resource="https://dblp.org/rec/conf/pods/2019"/>
</dblp:Publication>
--<rdf:Description rdf:about="https://dblp.org/rec/conf/pods/ArenasCJR19.rdf">
--<rdfs:label>
  provenance information for RDF data of dblp record 'conf/pods/ArenasCJR19'
</rdfs:label>
<dcterms:creator rdf:resource="https://dblp.org"/>
<dcterms:isPartOf rdf:resource="https://dblp.org/rdf/dblp.rdf"/>
<dcterms:license rdf:resource="https://opendatacommons.org/licenses/by/1.0"/>
<dcterms:modified>2019-06-16T19:28:47+0200</dcterms:modified>
</rdf:Description>
</rdf:RDF>
```

Resource Definition Framework(RDF)

Graph of the data model



Turtle syntax for RDF

Terse RDF Triple Language (Turtle) is a text-based syntax for RDF. Turtle text files have the extension ".ttl."

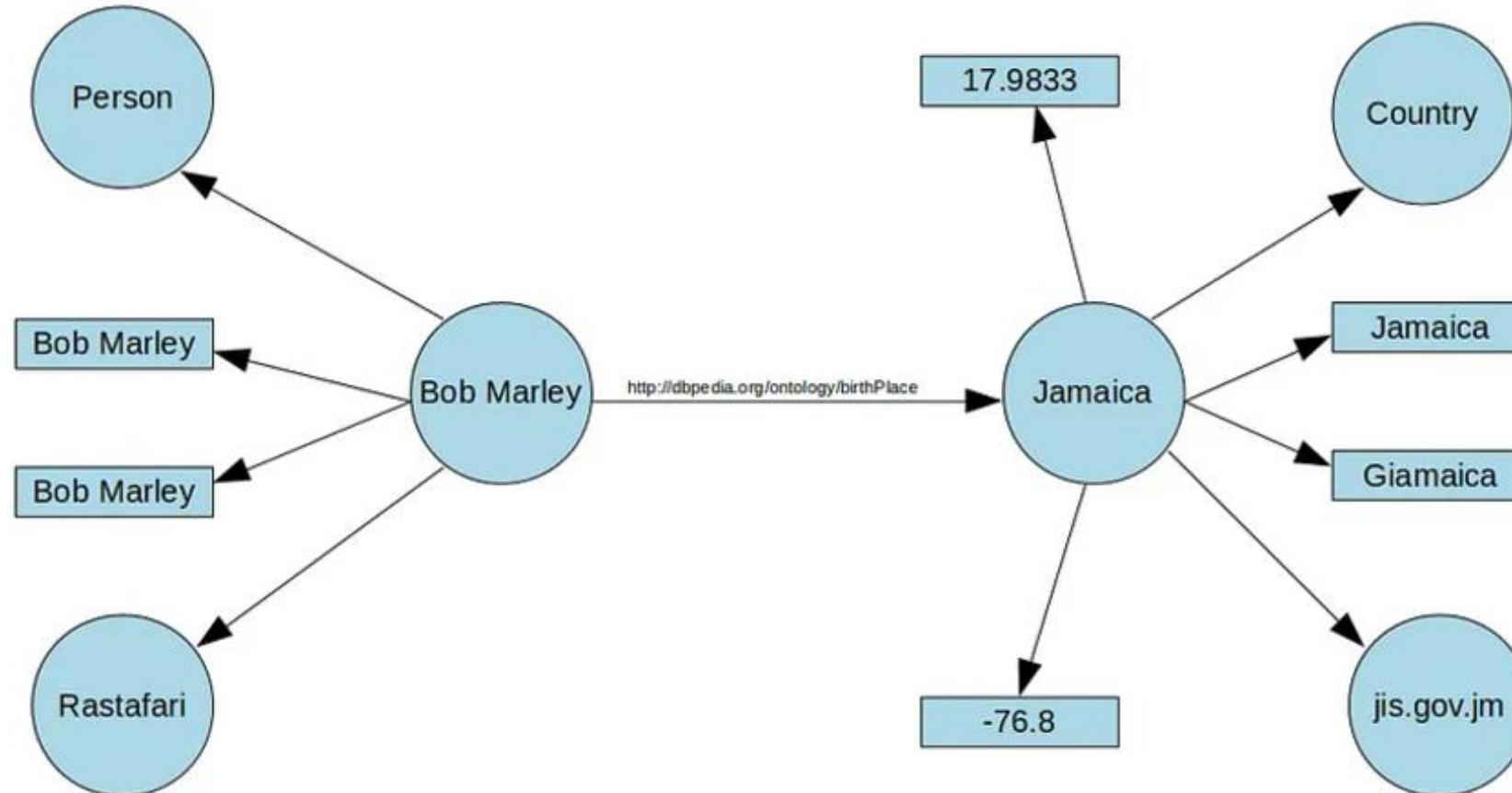
- URLs are enclosed in angle brackets.
- The Subject, Property, and Object of a statement appear in order, followed by a period (.)

Turtle syntax for RDF

```
-->
@prefix cd: <http://www.recshop.fake/cd#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

<http://www.recshop.fake/cd/Empire Burlesque>
    cd:artist    "Bob Dylan" ;
    cd:company   "Columbia" ;
    cd:country   "USA" ;
    cd:price     "10.90" ;
    cd:year      "1985" .
```

Turtle syntax for RDF



Reference: <https://medium.com/wallscope/understanding-linked-data-formats-rdf-xml-vs-turtle-vs-n-triples-eb931dbe9827>

Turtle syntax for RDF

- (1) <http://dbpedia.org/resource/Bob_Marley> <<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>> <<http://xmlns.com/foaf/0.1/Person>> .
- (2) <http://dbpedia.org/resource/Bob_Marley> <<http://www.w3.org/2000/01/rdf-schema#label>> "Bob Marley"@en .
- (3) <http://dbpedia.org/resource/Bob_Marley> <<http://www.w3.org/2000/01/rdf-schema#label>> "Bob Marley"@fr .
- (4) <http://dbpedia.org/resource/Bob_Marley> <<http://www.w3.org/2000/01/rdf-schema#seeAlso>> <<http://dbpedia.org/resource/Rastafari>> .
- (5) <http://dbpedia.org/resource/Bob_Marley> <<http://dbpedia.org/ontology/birthPlace>> <<http://dbpedia.org/resource/Jamaica>> .
- (6) <<http://dbpedia.org/resource/Jamaica>> <<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>> <<http://schema.org/Country>> .
- (7) <<http://dbpedia.org/resource/Jamaica>> <<http://www.w3.org/2000/01/rdf-schema#label>> "Jamaica"@en .
- (8) <<http://dbpedia.org/resource/Jamaica>> <<http://www.w3.org/2000/01/rdf-schema#label>> "Giamaica"@it .
- (9) <<http://dbpedia.org/resource/Jamaica>> <http://www.w3.org/2003/01/geo/wgs84_pos#lat> "17.9833"^^<<http://www.w3.org/2001/XMLSchema#float>> .
- (10) <<http://dbpedia.org/resource/Jamaica>> <http://www.w3.org/2003/01/geo/wgs84_pos#long> "-76.8"^^<<http://www.w3.org/2001/XMLSchema#float>> .
- (11) <<http://dbpedia.org/resource/Jamaica>> <<http://xmlns.com/foaf/0.1/homepage>> <<http://jis.gov.jm/>> .

Turtle syntax for RDF

```
@prefix dbr: <http://dbpedia.org/resource/> .  
@prefix dbo: <http://dbpedia.org/ontology/> .  
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .  
@prefix foaf: <http://xmlns.com/foaf/0.1/> .  
@prefix geo: <http://www.w3.org/2003/01/geo/wgs84_pos#> .  
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .  
@prefix schema: <http://schema.org/> .
```

```
dbr:Bob_Marley  
a foaf:Person ;  
rdfs:label "Bob Marley"@en ;  
rdfs:label "Bob Marley"@fr ;  
rdfs:seeAlso dbr:Rastafari ;  
dbo:birthPlace dbr:Jamaica .
```

```
dbr:Jamaica  
a schema:Country ;  
rdfs:label "Jamaica"@en ;  
rdfs:label "Giamaica"@it ;  
geo:lat "17.9833"^^xsd:float ;  
geo:long "-76.8"^^xsd:float ;  
foaf:homepage <http://jis.gov.jm/> .
```

Q & A