

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:ychen="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."

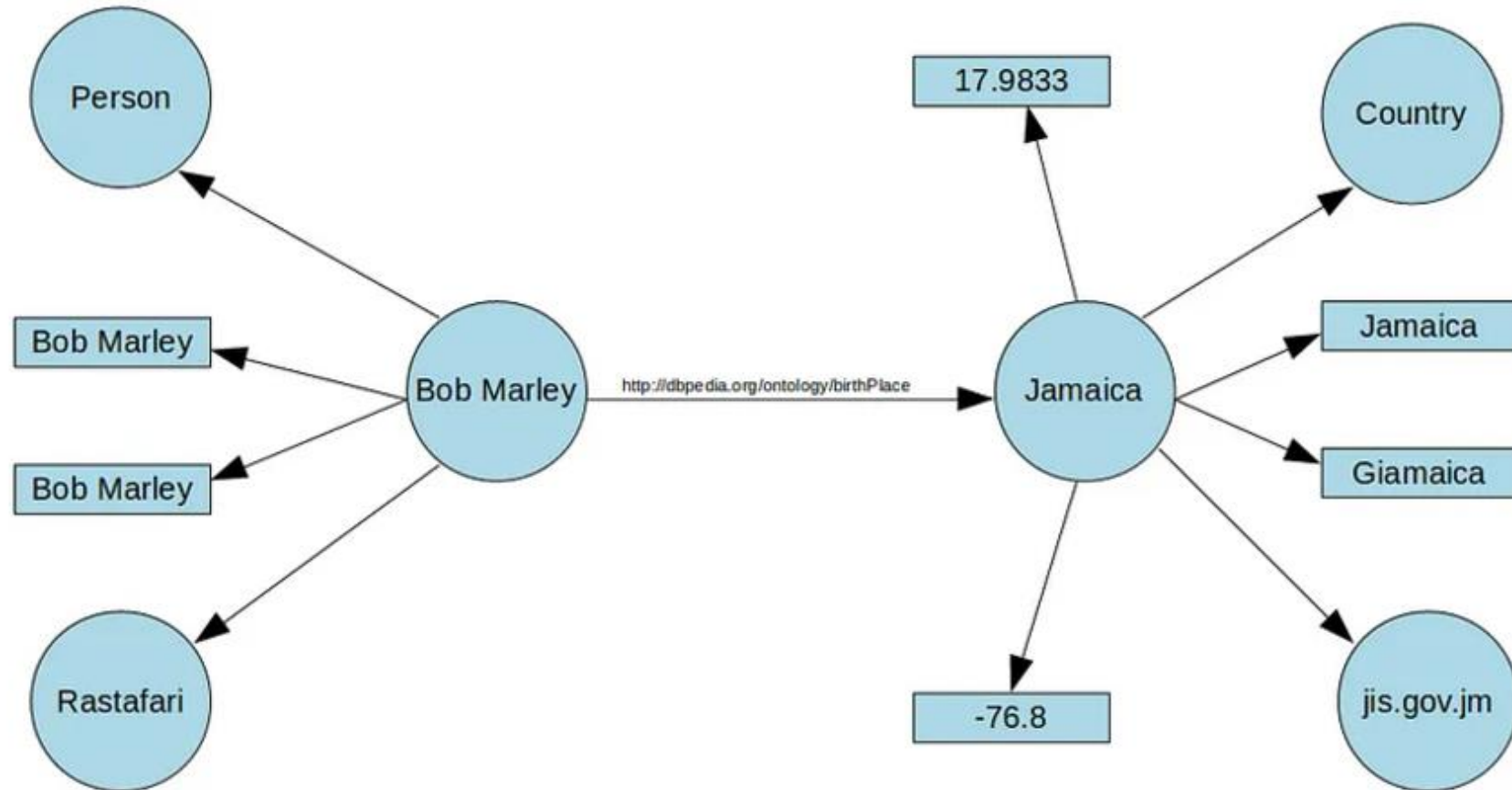
- URLs are enclosed in angle brackets.
- The Subject, Property, and Object of a statement appear in order, followed by a period (.)

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



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