

AGH

University of Science and Technology in Krakow

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## Report

Resource Description Framework (RDF) in use

Group: Wednesday 8:00

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# 1. Semantic vocabularies: Dublin Core

## 2. RDFSchema

```
<?xml version="1.0"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:dc="http://purl.org/dc/elements/1.1/">

  <rdfs:Class rdf:ID="LibraryContent"/>
  <rdfs:Class rdf:ID="Book">
  <rdfs:subClassOf rdf:resource="#LibraryContent"/>
  </rdfs:Class>
  <rdfs:Class rdf:ID="AudioCD">
  <rdfs:subClassOf rdf:resource="#LibraryContent"/>
  </rdfs:Class>

  <rdf:Description rdf:about="http://example.org/mylibrary#book-wind-sower">
    <dc:description
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Fantasy book about angle
and demon realm</dc:description>
    <dc:publisher
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Fabryka slow</dc:publisher>
    <dc:creator
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Maja Lidia
Kossakowska</dc:creator>
    <dc:date rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2007-
04-02</dc:date>
    <dc:title
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Siewca Wiatru</dc:title>
    <dc:language>pl</dc:language>
    <rdf:type rdf:resource="http://example.org/mylibrary#Book"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#book-dark-elf-
daughter">
    <dc:creator
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Ellaine
Cunningham</dc:creator>
    <dc:title
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Corka Mrocznego
Elfa</dc:title>
    <dc:date rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2009-
11-15</dc:date>
    <dc:language>pl</dc:language>
    <rdf:type rdf:resource="http://example.org/mylibrary#Book"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#book-faith-
consideration">
    <dc:creator
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">ks. Tadeusz
Dajczer</dc:creator>
    <dc:title
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Rozwazanie o
Wierze</dc:title>
    <publication
rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2008-02-13</publication>
    <dc:language>pl</dc:language>
```

```

        <rdf:type rdf:resource="http://example.org/mylibrary#Book"/>
    </rdf:Description>
    <rdf:Description rdf:about="http://example.org/mylibrary#book-hut">
        <dc:creator
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">William P.
Young</dc:creator>
        <dc:title
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Chata</dc:title>
        <dc:language>pl</dc:language>
        <rdf:type rdf:resource="http://example.org/mylibrary#Book"/>
    </rdf:Description>
    <rdf:Description rdf:about="http://example.org/mylibrary#cd-nightwish-dark-
passion-play">
        <dc:creator
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Nightwish</dc:creator>
        <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Dark
Passion Play</dc:title>
        <dc:language>en</dc:language>
        <rdf:type rdf:resource="http://example.org/mylibrary#AudioCD"/>
    </rdf:Description>
</rdf:RDF>

```

### 3. SPARQL – demo

#### What semantic vocabularies are used in the queries? What are they for?

FOAF – used for describing people personal information and relations between people

Dublin Core – used for

SIOC – used for exchanging information between forums, blogs, etc.

PRJ – describing projects

RSS – very popular web format used for content change notifications, so programs can feed news from website

#### What do SELECT queries do?

They ask about specific data determined by query and returns data received by filtering datasets with this query.

#### What do CONSTRUCT queries do?

Construct queries instead of data returns graphs build on data returned by query.

### 4. SPARQL queries – basics

#### friends who have name and e-mail defined

```

PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

```

```

SELECT ?x
WHERE
{
    ?x rdf:type foaf:Person ;
    foaf:name ?name ;
    foaf:mbox ?mail .
}

```

```
}
```

### friends who have name and e-mail defined and optional homepage

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:name ?name ;
  foaf:mbox ?mail .
  OPTIONAL { ?x foaf:homepage }
}
```

### friends who have name and e-mail defined and optional homepage, sorted by name descending

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:name ?name ;
  foaf:mbox ?mail .
  OPTIONAL { ?x foaf:homepage }
}
ORDER BY DESC(?name)
```

## 5. SPARQL queries – options

### people whose name starts with 'K'

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:name ?name .
  FILTER regex(?name, '^K') .
}
```

### people who are older than 18 years old

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:name ?name ;
  foaf:age ?age .
}
```

```
FILTER (?age > 18) .
}
```

### people whose name starts with 'K' or are older than 18 years old, make search caseinsensitive

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:name ?name ;
  foaf:age ?age .
  FILTER (?age > 18 || regex(?name, '^K', 'i')) .
}
```

### people having e-mails on student.agh.edu.pl server

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  ?x rdf:type foaf:Person ;
  foaf:mbox ?mail .
  FILTER regex(?mail, '@student.agh.edu.pl') .
}
```

### name of people, who have homepage or e-mail on student.agh.edu.pl server

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

SELECT ?x
WHERE
{
  {
    ?x rdf:type foaf:Person ;
    foaf:name ?name ;
    foaf:mbox ?mail .
    FILTER regex(?mail, '@student.agh.edu.pl') .
  }
  UNION
  {
    ?x rdf:type foaf:Person ;
    foaf:name ?name ;
    foaf:homepage ?homepage .
    FILTER regex(?homepage, 'student.agh.edu.pl/') .
  }
}
```

## 6. Open Data Sets

**Answer the question: What are the main limitations of using (querying for information) the RDF datasets such as DBPedia or MusicBrainz?**

One of the problem with datasets such as DBPedia and MusicBrainz is lack of similiarity with resource description. It's not hard to see same data described in different ways, so as result one must analyze data himself to see correlation. Other big problem is amount of data which is vast. This cause more complex queries to take much time and use a lot of server computation power.