

Podstawy Inżynierii Wiedzy
Informatyka Stosowana
Wydział Elektrotechniki, Automatyki, Informatyki i
Elektroniki



AGH

Sprawozdanie nr 3:
Resource Description
Framework (RDF) in use

Jarosław Bodnar
Mikołaj Mesjasz

Grupa: środa 8.00

1. Semantic vocabularies: Dublin Core

```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns="http://example.org/mylibrary#"
  xmlns:s="http://example.org/books/vocab#"
  xmlns:a="http://example.org/actors/vocab#"
  xmlns:dc="http://purl.org/dc/elements/1.1/">
  <rdf:Description rdf:about="http://example.org/mylibrary#book-hibernate">
    <author>Chris Bauer</author>
    <author>Gavin King</author>
    <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Hibernate in
Action</dc:title>
    <year
rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2005</year>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#cd-prague_orchestra">
    <artist rdf:datatype="http://www.w3.org/2001/XMLSchema#string">City of
Prague Philharmonic Orchestra</artist>
    <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Film
Music</dc:title>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#dvd-godfather">
    <dc:title>The Godfather</dc:title>
    <year
rdf:datatype="http://www.w3.org/2001/XMLSchema#date">1972</year>
    <director>Francis Ford Coppola</director>
    <a:actors rdf:parseType="Collection">
      <rdf:Description rdf:about="http://example.org/actors/Al_Pacino"/>
      <rdf:Description rdf:about="http://example.org/actors/Marlon_Brando"/>
      <rdf:Description rdf:about="http://example.org/actors/Diane_Keaton"/>
      <rdf:Description rdf:about="http://example.org/actors/Robert_Duvall"/>
    </a:actors>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#my_favourite_books">
    <s:myFavouriteBooks>
      <rdf:Bag>
        <rdf:li rdf:resource="http://example.org/books/Janson_Directive"/>
        <rdf:li rdf:resource="http://example.org/books/Apocalypse_Watch"/>
        <rdf:li rdf:resource="http://example.org/books/Secret_Sanction"/>
      </rdf:Bag>
    </s:myFavouriteBooks>
  </rdf:Description>
</rdf:RDF>
```

2. RDFSchema

```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns="http://example.org/mylibrary#"
  xmlns:s="http://example.org/books/vocab#"
  xmlns:a="http://example.org/actors/vocab#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

  <rdfs:Class rdf:ID="MultimediaItem" />
  <rdfs:Class rdf:ID="MusicCD">
    <rdfs:subClassOf rdf:resource="#MultimediaItem"/>
    <rdfs:label>Music Compact Discs class</rdfs:label>
    <rdfs:comment>Class of all the CDs in my library.</rdfs:comment>
  </rdfs:Class>
  <rdfs:Class rdf:ID="Book">
    <rdfs:subClassOf rdf:resource="#MultimediaItem"/>
  </rdfs:Class>

  <rdf:Description rdf:about="http://example.org/mylibrary#book-hibernate">
    <author>Chris Bauer</author>
    <author>Gavin King</author>
    <title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Hibernate in
Action</title>
    <year
rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2005</year>
    <rdf:type rdf:resource="http://example.org/mylibrary#MusicCD"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#cd-prague_orchestra">
    <artist rdf:datatype="http://www.w3.org/2001/XMLSchema#string">City of
Prague Philharmonic Orchestra</artist>
    <title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Film Music</title>
    <rdf:type rdf:resource="http://example.org/mylibrary#MusicCD"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#dvd-godfather">
    <title>The Godfather</title>
    <year
rdf:datatype="http://www.w3.org/2001/XMLSchema#date">1972</year>
    <director>Francis Ford Coppola</director>
    <rdf:type rdf:resource="http://example.org/mylibrary#MusicCD"/>
    <a:actors rdf:parseType="Collection">
      <rdf:Description rdf:about="http://example.org/actors/Al_Pacino"/>
      <rdf:Description rdf:about="http://example.org/actors/Marlon_Brando"/>
    </a:actors>
  </rdf:Description>
</rdf:RDF>
```

```

        <rdf:Description rdf:about="http://example.org/actors/Diane Keaton"/>
      <rdf:Description rdf:about="http://example.org/actors/Robert_Duvall"/>
    </a:actors>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.org/mylibrary#my_favourite_books">
    <rdf:type rdf:resource="http://example.org/mylibrary#MusicCD"/>
    <s:myFavouriteBooks>
      <rdf:Bag>
        <rdf:li rdf:resource="http://example.org/books/Janson_Directive"/>
        <rdf:li rdf:resource="http://example.org/books/Apocalypse_Watch"/>
        <rdf:li rdf:resource="http://example.org/books/Secret_Sanction"/>
      </rdf:Bag>
    </s:myFavouriteBooks>
  </rdf:Description>
</rdf:RDF>

```

3.1. What semantic vocabularies are used in the queries? What are they for?

1. **FOAF** (Friend of a friend) - opisywanie osób i zależności pomiędzy nimi,
2. **DC** (Dublin Core) – format zapisu metadanych. Wykorzystuje się do opisu elementów w XML lub XHTML z użyciem właśnie definiowanych elementów w DC,
3. **SIOC** (Semantically-Interlinked Online Communities Project) – łączy ze sobą różnego rodzaju platformy dyskusyjne np.: fora, blogi i inne
4. **REV (Review Vocabulary)** – opis recenzji i rankingu
5. **PRJ (Project Vocabulary)** – opisy projektów
6. **RSS (Really Simple Syndication)** – opisywanie i powiadamianie o zmianach na stronach internetowych (nowych wpisach na blogu itp.). Bazuje na XML-u.

3.3. What do SELECT queries do?

SELECT służy do pobierania danych, które spełniają zadane kryteria w zapytaniu. Później wyniki są zwracane w postaci tabeli.

3.4. What do CONSTRUCT queries do? Put the constructed queries in the report.

CONSTRUCT służy do pobierania danych, które spełniają dane kryteria i zwraca je w postaci dokumentu RDF.

4. SPARQL queries – basics,

- friends who have name and e-mail defined :

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

PREFIX foaf: <http://xmlns.com/foaf/0.1/>

SELECT DISTINCT ?name ?email

WHERE {

```
?x rdf:type foaf:Person;
foaf:name ?name;
foaf:mbox ?mail
}
```

- **friends who have name and e-mail defined and optional homepage :**

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

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

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

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

```
SELECT DISTINCT ?name ?email ?homepage
WHERE {
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:mbox ?mail.
    OPTIONAL { ?x foaf:homepage ?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 ?person
WHERE {
    ?person 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 ?person  
WHERE {  
?person rdf:type foaf:Person;  
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 ?person  
WHERE {  
?person rdf:type foaf:Person;  
foaf:age ?age;  
foaf:name ?name.  
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 ?person  
WHERE {  
?person rdf:type foaf:Person;  
foaf:mbox ?mail.  
FILTER regex(?mail,'@student.agh.edu.pl','i').  
}
```

- 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 ?name

WHERE {

?person rdf:type foaf:Person;

foaf:name ?name;

foaf:mbox ?mail;

foaf:homepage ?homepage.

FILTER (regex(?mail,'@student.agh.edu.pl','i') ||

regex(?homepage,'student.agh.edu.pl/~','i')).

}

6. Open Data Sets - What are the main limitations of using (querying for information) the RDF datasets such as DBpedia or MusicBrainz?

Głównym ograniczeniem w wykorzystywaniu powyższych zasobów jest wolne działanie ze względu na ogromną ilość materiałów, które trzeba przeanalizować. Poza tym im bardziej skomplikowane zapytanie, tym dłużej będziemy czekali na odpowiedź, zwłaszcza jeśli dokumenty znajdują się na różnych serwerach w znacznej odległości.