

Podstawy Inżynierii Wiedzy - Semantic Web

Sprawozdanie 3:

Resource Description Framework (RDF) in use

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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://agh.edu.pl/~zlukeasz/mylibrary#">

  <rdf:Description rdf:about="http://agh.edu.pl/~zlukeasz/mylibrary#book-Gra-o-tron">
    <dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      Martin George R.R.</dc:author>
    <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Gra o
      tron</dc:title>
    <dc:publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
      2011-03-09</dc:publicationDate>
  </rdf:Description>

  <rdf:Description rdf:about="http://agh.edu.pl/~zlukeasz/mylibrary#book-Android-w-
    akcji">
    <dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
```

```
W. Frank Ableson.</dc:author>
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
Robi Sen.</dc:author>
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
Chris King.</dc:author>
<dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Android w ak-
cji</dc:title>
<dc:publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
2011-10-02</dc:publicationDate>
</rdf:Description>
```

```
<rdf:Description rdf:about="http://agh.edu.pl/~zluksasz/mylibrary#book-Java-
zaawansowane">
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
Cay S. Horstmann.</dc:author>
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
Gary Cornell.</dc:author>
<dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Java techniki
zaawansowane</dc:title>
<dc:publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
2009-02-12</dc:publicationDate>
</rdf:Description>
```

```
<rdf:Description rdf:about="http://agh.edu.pl/~zluksasz/mylibrary#book-Php-vandemecum
">
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
W. Frank Ableson.</dc:dc:author>
<dc:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
Robi Sen.</dc:author>
<dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Php i MYSQL.
Tworzenie stron WWW. Vandemecum Profesjonalisty</dc:title>
<dc:publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
2009-10-03</dc:publicationDate>
</rdf:Description>
```

```
<rdf:Description rdf:about="http://agh.edu.pl/~zluksasz/mylibrary">
<ComputerScienceBooks>
<rdf:Bag>
<rdf:li rdf:resource="http://agh.edu.pl/~zluksasz/mylibrary#book-Android-w-
akcji" />

<rdf:li rdf:resource="http://agh.edu.pl/~zluksasz/mylibrary#book-Php-vandemecum " />
<rdf:li rdf:resource="http://agh.edu.pl/~zluksasz/mylibrary#book-Java-
zaawansowane " />
```

```
</rdf:Bag>
</ComputerScienceBooks>
</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://agh.edu.pl/~zluksasz/mylibrary#">

  <rdfs:Class rdf:ID="MultimedialItem" />
    <rdfs:Class rdf:ID="Book">
      <rdfs:subClassOf rdf:resource="#MultimedialItem"/>
      <rdfs:label>Class with books on my shelf</rdfs:label>
    </rdfs:Class>

  <rdf:Description rdf:about="http://agh.edu.pl/~zluksasz/mylibrary#book-Gra-o-tron">
    <author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      Martin George R.R.</author>
    <title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Gra o tron</title>
    <publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
      2011-03-09</publicationDate>
    <rdf:type rdf:resource="agh.edu.pl/~zluksasz/mylibrary#Book"/>
  </rdf:Description>

  <rdf:Description rdf:about="http://agh.edu.pl/~zluksasz/mylibrary#book-Android-w-
  akcji">
    <author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      W. Frank Ableson.</author>
    <author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      Robi Sen.</author>
    <author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
      Chris King.</author>
    <title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Android w ak-
    cji</title>
    <publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">
      2011-10-02</publicationDate>
```

<rdf:type rdf:resource="agh.edu.pl/~zluasz/mylibrary#Book"/>

</rdf:Description>

<rdf:Description rdf:about="http://agh.edu.pl/~zluasz/mylibrary#book-Java-zaawansowane">

<author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">

Cay S. Horstmann.</author>

<author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">

Gary Cornell.</author>

<title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Java techniki zaawansowane</title>

<publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">

2009-02-12</publicationDate>

<rdf:type rdf:resource="agh.edu.pl/~zluasz/mylibrary#Book"/>

</rdf:Description>

<rdf:Description rdf:about="http://agh.edu.pl/~zluasz/mylibrary#book-Php-vandemecum">

<author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">

W. Frank Ableson.</author>

<author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">

Robi Sen.</author>

<title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Php i MYSQL. Tworzenie stron WWW. Vandemecum Profesjonalisty</title>

<publicationDate rdf:datatype="http://www.w3.org/2001/XMLSchema#date">

2009-10-03</publicationDate>

<rdf:type rdf:resource="agh.edu.pl/~zluasz/mylibrary#Book"/>

</rdf:Description>

<rdf:Description rdf:about="http://agh.edu.pl/~zluasz/mylibrary">

<ComputerScienceBooks>

<rdf:Bag>

<rdf:li rdf:resource="http://agh.edu.pl/~zluasz/mylibrary#book-Android-w-akcji" />

<rdf:li rdf:resource="http://agh.edu.pl/~zluasz/mylibrary#book-Php-vandemecum" />

<rdf:li rdf:resource="http://agh.edu.pl/~zluasz/mylibrary#book-Java-zaawansowane" />

</rdf:Bag>

</ComputerScienceBooks>

</rdf:Description>

</rdf:RDF>

3 SPARQL - demo

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. SIOC (Semantically-Interlinked Online Communities Project) – platform dyskusyjne np.: fora, blogi i inne
3. DC (Dublin Core) – format zapisu metadanych. Wykorzystuje się do opisu zasobów internetowych.
4. REV (Review Vocabulary) – słownik wykorzystywany do opisu recenzji i rankingów
5. PRJ (Project Vocabulary) – opisy projektów
6. RSS (Really Simple Syndication) – formatu danych służących do informowania i dostarczania treści do użytkownika, bazuje na XML-u.

3.3. What do SELECT queries do?

Zapytanie SELECT zwraca dane z zapytania w postaci tabeli.

3.4. What do CONSTRUCT queries do?

Zapytanie CONSTRUCT zwraca dane zapytania 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 .
```

```
  ?x foaf:name ?name .
```

```
  ?x foaf:mbox ?email
```

```
}
```

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
  WHERE {
    ?x rdf:type foaf:Person .
    ?x foaf:name ?name .
    ?x foaf:mbox ?email
  }

```

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 .
    ?x foaf:name ?name.
    ?x foaf:mbox ?email.
    OPTIONAL {
      ?x foaf:homepage ?homepage
    }
  }
ORDER BY DESC(?name)

```

5 SPARQL queries – options

People whose name starts with 'K'

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT DISTINCT ?name
  WHERE {
    ?x rdf:type foaf:Person .
    ?x foaf:name ?name .
    FILTER regex(?name, "^K")
  }

```

People who are older than 18 years old

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT DISTINCT ?name ?age
  WHERE {

```

```

    ?x rdf:type foaf:Person .
    ?x foaf:name ?name .
    ?x foaf:age ?age.
    FILTER(?age > '18')
}
LIMIT 10

```

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

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT DISTINCT ?name ?age
  WHERE {
    ?x rdf:type foaf:Person ; {
      ?x foaf:age ?age
      FILTER (?age > '18')
    }
    UNION {
      ?x foaf:name ?name
      FILTER regex(?name, "^K.*", "i")
    }
  }
}

```

People having e-mails on student.agh.edu.pl server

```

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 .
    ?x foaf:name ?name .
    ?x foaf:mbox ?email
    FILTER regex(?email, „.*student.agh.edu.pl$”)
  }
}

```

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

```

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 .
    ?x foaf:name ?name . {

```

```

        ?x foaf:mbox ?email .
        FILTER regex(?email, „.*student.agh.edu.pl$”)
    }
    UNION {
        ?x foaf:homepage ?homepage
        FILTER regex(?homepage, „^ http :// student. agh. edu. pl .*”)
    }
}

```

6 Open Data Sets

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

Podstawowym ograniczeniem jest bardzo długi czas oczekiwania na wynik zapytania – wraz ze wzrostem zasobów oraz stopnie skomplikowania zapytania czas oczekiwania na odpowiedź się wydłuża. Dodatkowo od użytkownika wymagana jest znajomość SPARQL.