

**Akademia Górniczo-Hutnicza
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**Wydział Elektrotechniki, Automatyki, Informatyki i
Elektroniki**

Podstawy inżynierii wiedzy

Semantic Web

Temat: Modeling knowledge with Resource Description Framework (RDF)

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Wtorek 17:30

1. RDF Model

- Why is the node for „<http://www.w3.org/>” oval and the node for „World Wide Web Consortium” rectangular? What's the difference between these two resources?

Węzeł dla „<http://www.w3.org/>” jest owalny, ponieważ jest zasobem (podmiotem lub obiektem). „World Wide Web Consortium” natomiast jest literałem.

- What's the meaning of the nodes for `genid:A15816` and `genid:A15815` objects?

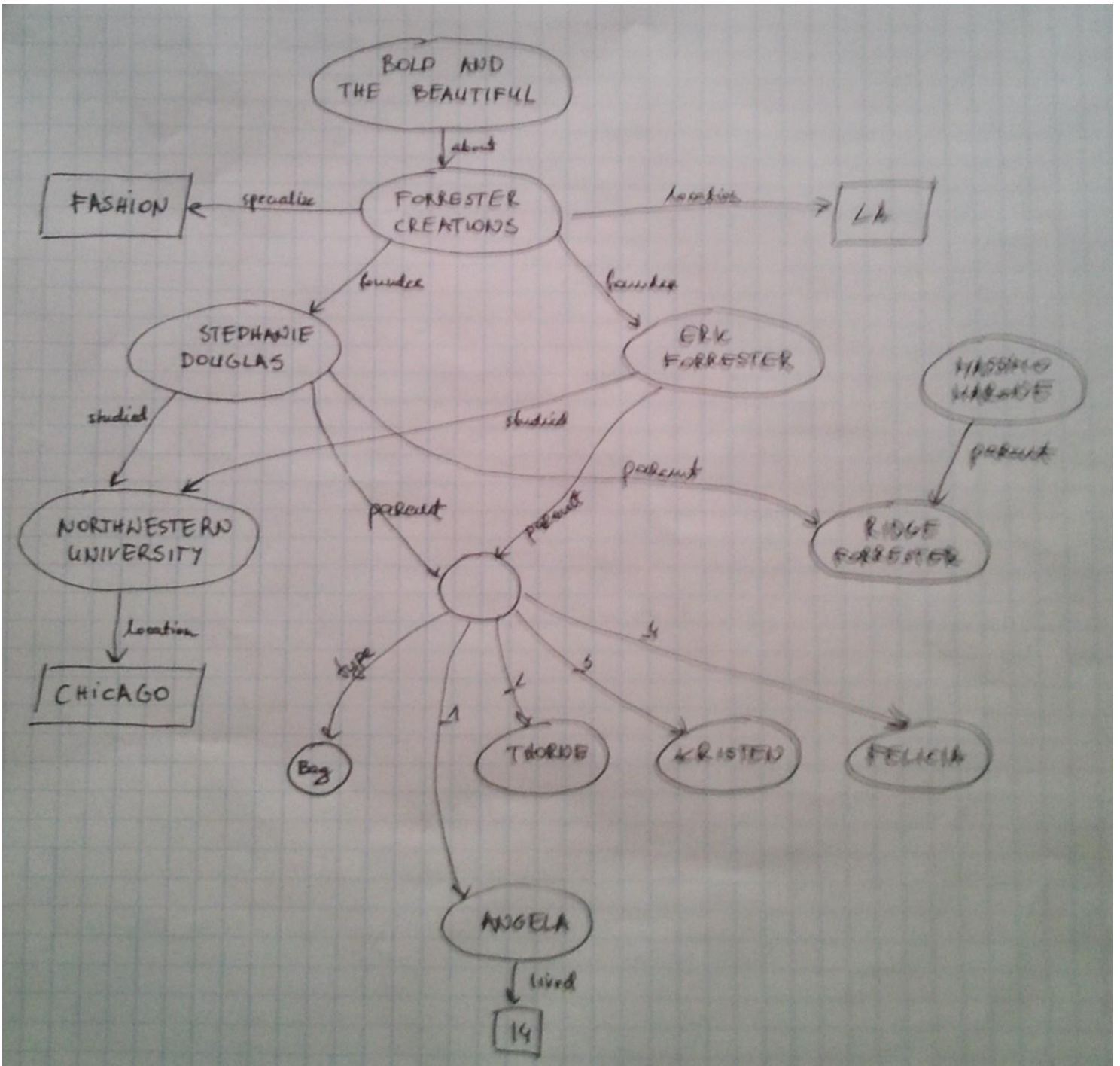
Te oznaczenia to węzły puste. Jest to węzeł bez określonego URI, który jednak jest konieczny do poprawnego wyświetlenia struktury grafu. Wartość pustego węzła jest generowana automatycznie przez validator.

2. Modeling knowledge with RDF graphs

- How can you represent relations with more than 2 resources involved? If you can, put such an information in your graph.

Relacja z więcej niż dwoma zasobami może być reprezentowana poprzez zastosowanie węzła pustego. Podmiot relacji pozostaje, natomiast obiekt zostaje zastąpiony przez węzeł pusty, który następnie tworzy relację z wieloma innymi obiektami. W załączonym grafie dzieci Stephanie i Erica są przykładem takiej relacji (dodatkowego stworzonej tu jako Bag).

- Put the sketch (a scan/picture) of the graph in your report.



3. Modeling knowledge with RDF triples

- Include both documents (.ttl and .rdf) in the report archive.

TTL:

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

@prefix xsd: <http://www.w3.org/2001/XMLSchema#>.

@prefix bb: <http://student.agh.edu.pl/~nawojka/b-and-b#>.

bb:Bold-and-the-beautiful bb:about bb:Forrester-Creations.

bb:Forrester-Creations

bb:location bb:LA;
bb:specialize bb:Fashion;
bb:founder bb:Stephanie-Douglas;
bb:founder bb:Eric-Forrester.

bb:Massimo-Marone bb:parent bb:Ridge-Forrester.

bb:Stephanie-Douglas

bb:studied bb:Northwestern-University;
bb:parent bb:Ridge-Forrester;
bb:parent bb:_children.

bb:Eric-Forrester

bb:studied bb:Northwestern-University;
bb:parent bb:_children.

bb:Northwestern-University bb:location bb:Chicago.

_:children

rdf:type rdf:Bag;

rdf:_1 bb:Thorne;

rdf:_2 bb:Kristen;

rdf:_3 bb:Felicja;

rdf:_4 bb:Angela.

bb:Angela bb:lived "14"^^xsd:integer.

RDF:

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

```
<rdf:RDF xmlns:xsd="http://www.w3.org/2001/XMLSchema#" xmlns:bb="http://student.agh.edu.pl/~nawojka/b-and-b#"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
```

```
  <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-b#Bold-and-the-beautiful">
```

```
    <bb:about>
```

```
      <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-b#Forrester-
```

```
Creations">
```

```
        <bb:location rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#LA" />
```

```
        <bb:specialize rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Fashion" />
```

```
        <bb:founder>
```

```
          <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-
```

```
b#Stephanie-Douglas">
```

```
            <bb:studied>
```

```
              <rdf:Description
```

```
                rdf:about="http://student.agh.edu.pl/~nawojka/b-and-b#Northwestern-University">
```

```
                  <bb:location
```

```
                    rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Chicago" />
```

```
                </rdf:Description>
```

```
            </bb:studied>
```

```
          <bb:parent rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-
```

```
b#Ridge-Forrester" />
```

```

        <bb:parent rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-
b#_children" />

        </rdf:Description>
    </bb:founder>
    <bb:founder>
        <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-
b#Eric-Forrester">
            <bb:studied rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-
b#Northwestern-University" />
            <bb:parent rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-
b#_children" />

            </rdf:Description>
        </bb:founder>
    </rdf:Description>
    </bb:about>
</rdf:Description>
<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-b#Massimo-Marone">
    <bb:parent rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Ridge-Forrester" />
</rdf:Description>
<rdf:Bag>
    <rdf:li rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Thorne" />
    <rdf:li rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Kristen" />
    <rdf:li rdf:resource="http://student.agh.edu.pl/~nawojka/b-and-b#Felicja" />
    <rdf:li>
        <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/b-and-b#Angela">
            <bb:lived rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">14</bb:lived>
        </rdf:Description>
    </rdf:li>
</rdf:Bag>
</rdf:RDF>

```

4. Modeling knowledge with RDF/XML

5. RDF/XML document: Containers and Collections

6. RDF/XML document: Datatypes

- Include your RDF/XML document in the report archive.

```

<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:library="http://student.agh.edu.pl/~nawojka/mylibrary#">

    <rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/book-shining">
        <library:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Stephen King</library:author>
        <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">The Shining</library:title>
        <library:country rdf:datatype="http://www.w3.org/2001/XMLSchema#string">USA</library:country>
        <library:year>2001</library:year>
    </rdf:Description>

```

```

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/book-liseysstory">
  <library:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Stephen King</library:author>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">lisey's Story</library:title>
    <library:country rdf:datatype="http://www.w3.org/2001/XMLSchema#string">USA</library:country>
    <library:year>2006</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/book-catch22">
  <library:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Joseph Heller</library:author>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Catch 22</library:title>
    <library:country rdf:datatype="http://www.w3.org/2001/XMLSchema#string">England</library:country>
    <library:year>1988</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/book-crime">
  <library:author rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Fyodor Dostoevsky</library:author>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Crime and Punishment</library:title>
    <library:country rdf:datatype="http://www.w3.org/2001/XMLSchema#string">England</library:country>
    <library:year>1993</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/book-cprogramming">
<library:authors rdf:parseType="Collection">
<rdf:Description>
  <rdf:first rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Brian W. Kerninghan</rdf:first>
  <rdf:rest>
    <rdf:Description>
      <rdf:first rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Dennis M. Ritchie</rdf:first>
      <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdfsyntax-ns#nil" />
    </rdf:Description>
  </rdf:rest>
</rdf:Description>
  </library:authors>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">The C Programming Language</library:title>
    <library:country rdf:datatype="http://www.w3.org/2001/XMLSchema#string">England</library:country>
    <library:year>1989</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojkag/mylibrary/cd-madeinheaven">
  <library:artist rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Queen</library:artist>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Made in Heaven</library:title>
    <library:year>1995</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojkag/mylibrary/cd-innuendo">
  <library:artist rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Queen</library:artist>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Innuendo</library:title>
    <library:year>1991</library:year>
</rdf:Description>

```

```
<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/cd-yellowsubmarine">
  <library:artist rdf:datatype="http://www.w3.org/2001/XMLSchema#string">The Beatles</library:artist>
  <library:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Yellow Submarine</library:title>
    <library:year>1969</library:year>
</rdf:Description>

<rdf:Description rdf:about="http://student.agh.edu.pl/~nawojka/mylibrary/MyFavouriteBooks">
  <library:MyFavouriteBooks>
    <rdf:Bag>
      <rdf:li rdf:resource="http://student.agh.edu.pl/~nawojka/mylibrary/book-catch22"/>
      <rdf:li rdf:resource="http://student.agh.edu.pl/~nawojka/mylibrary/book-shining"/>
    </rdf:Bag>
  </library:MyFavouriteBooks>
</rdf:Description>
</rdf:RDF>
```

7. RDF Visualization

- Are there any problems/limitations with the tool? Write your observations in the report.

Narzędzie generuje bardzo chaotyczne grafy. Po wczytaniu grafu z pliku RDF powstały graf bez żadnych filtrów jest trudny do odczytania (rysunek 1). Narzędzie dostarcza możliwości samodzielnego rozmieszczenia węzłów w bardziej czytelny sposób jednak jest to zajęcie czasochłonne. Narzędzie nie pokazuje żadnych informacji dotyczących sąsiedztwa wierzchołków grafu. RDFGravity jest lepsze do analizy małych, nieskomplikowanych grafów, przy dużych plikach rdf ze skomplikowaną strukturą grafy stają się nieczytelne.

- Include the screenshots of your files visualized with RDFGravity (or other RDF visualisation tool if you find one).

