

# Lab 3 - Modeling knowledge with RDF

## 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?**

<http://www.w3c.org> is URI and it link to some resource. "World Wide Web Consortium" node is just an literal and it doesnt link anywhere. Different shape helps to find differend between node types. Oval nodes can be linked to other nodes. Rectangles can be only leafs.

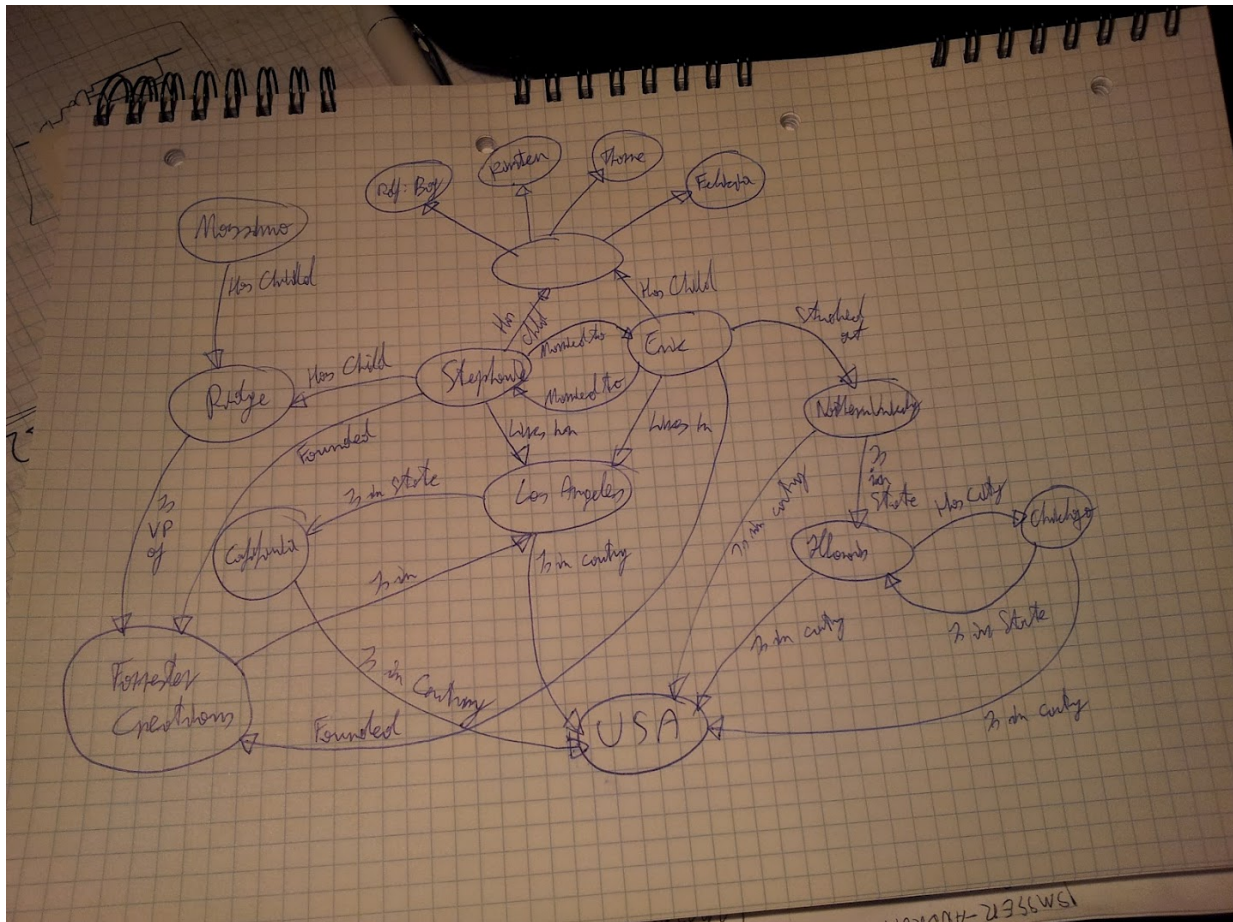
**What's the meaning of the nodes for `genid:A15816` and `genid:A15815` objects?**

This objects represents ID of resource, havve properties providing more information about resource.

## 2. Modeling knowledge with RDF graphs

**How can you represent relations with more than 2 resources involved?**

You can introduce an intermediate node which till act as “link” between those (more than 2) resources. Formally such node may be represented as type `rdf:Bag` [http://www.w3schools.com/rdf/rdf\\_containers.asp](http://www.w3schools.com/rdf/rdf_containers.asp) or other container which may better suit the relation being modeled. In our example children are modeled using a Bag.



### 3. Modeling knowledge with RDF triples

bnb.ttl

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.
@prefix xsd: <http://www.w3.org/2001/XMLSchema#>.
@prefix bnb: <http://project13.pl/rdf/bnb#>.
```

```
bnb:eric
  bnb:has_child      _:forrester_children;
  bnb:married_to    bnb:stephanie;
  bnb:studied_at    bnb:northwestern_university;
  bnb:founder_of    bnb:forrester_creations.
bnb:stephanie
  bnb:has_child      _:forrester_children;
  bnb:has_child      bnb:ridge;
  bnb:married_to    bnb:eric;
  bnb:founder_of    bnb:forrester_creations.
_:forrester_children
  rdf:type          rdf:Bag;
```

```

    rdf:_1          bnb:kristen;
    rdf:_2          bnb:thorne;
    rdf:_3          bnb:felicia.
bnb:massimo
  bnb:has_child    bnb:ridge.
bnb:ridge
  bnb:is_vp_of     bnb:forrester_creations.
bnb:northwestern_university
  bnb:is_in_state  bnb:illonois;
  bnb:is_in_country "USA"^^xsd:string.
bnb:forrester_creations
  bnb:is_in        bnb:los_angeles;
  bnb:is_in_country "USA"^^xsd:string.
bnb:chicago
  bnb:is_in_state  bnb:illonois;
  bnb:is_in_country "USA"^^xsd:string.
bnb:illonois
  bnb:has_city     bnb:chicago;
  bnb:is_in_country "USA"^^xsd:string.
bnb:los_angeles
  bnb:is_in_state  bnb:california;
  bnb:is_in_country "USA"^^xsd:string.
bnb:california
  bnb:has_city     bnb:los_angeles;
  bnb:is_in_country "USA"^^xsd:string.

```

**bnb.xml (RDF/XML)**

```

<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:bnb="http://project13.pl/rdf/bnb#" xmlns:xsd="http://www.w3.org/
2001/XMLSchema#">
  <rdf:Description rdf:about="http://project13.pl/rdf/bnb#eric">
    <bnb:has_child>
      <rdf:Bag rdf:nodeID="forrester_children">
        <rdf:li rdf:resource="http://project13.pl/rdf/
bnb#kristen" />
        <rdf:li rdf:resource="http://project13.pl/rdf/
bnb#thorne" />
        <rdf:li rdf:resource="http://project13.pl/rdf/
bnb#felicia" />
      </rdf:Bag>
    </bnb:has_child>
    <bnb:married_to>
      <rdf:Description rdf:about="http://project13.pl/rdf/
bnb#stephanie">
        <bnb:has_child rdf:nodeID="forrester_children" />
        <bnb:has_child>

```



```

rdf:about="http://project13.pl/rdf/bnb#california">
    <bnb:has_city
rdf:resource="http://project13.pl/rdf/bnb#los_angeles" />
    <bnb:is_in_country
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">USA</
bnb:is_in_country>
    </rdf:Description>
    </bnb:is_in_state>
    <bnb:is_in_country
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">USA</
bnb:is_in_country>
    </rdf:Description>
    </bnb:is_in>
    <bnb:is_in_country rdf:datatype="http://
www.w3.org/2001/XMLSchema#string">USA</bnb:is_in_country>
    </rdf:Description>
    </bnb:founder_of>
</rdf:Description>
<rdf:Description rdf:about="http://project13.pl/rdf/bnb#massimo">
    <bnb:has_child rdf:resource="http://project13.pl/rdf/
bnb#ridge" />
    </rdf:Description>
</rdf:RDF>

```

## 4 Modeling knowledge with RDF/XML

```

<?xml version="1.0" encoding="utf-8" ?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:lb="http://www.example.com/mylibrary">
  <rdf:Description rdf:about="http://example.com/mylibrary#CssGuide">
    <lb:author>Eric Meyer</lb:author>
    <lb:title>CSS: The define guide</lb:title>
    <lb:year>2008</lb:year>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.com/mylibrary#Webdesing">
    <lb:author>Dan Cederholm</lb:author>
    <lb:title>Buletproof web desing</lb:title>
    <lb:year>2008</lb:year>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.com/mylibrary#Rails">
    <lb:author>Sam Ruby</lb:author>
    <lb:author>Dave Thomas</lb:author>
    <lb:author>David Heinemeier Hansson</lb:author>
    <lb:title>Agile Web Development with Rails</lb:title>

```

```

    <lb:year>2011</lb:year>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.com/mylibrary#HeartOfDarkness">
    <lb:author>Joseph Conrad</lb:author>
    <lb:title>Heart of Darkness</lb:title>
    <lb:year>2010</lb:year>
  </rdf:Description>
  <rdf:Description rdf:about="http://example.com/mylibrary#Gladiator">
    <lb:title>Gladiator</lb:title>
    <lb:director>Ridley Scott</lb:director>
    <lb:actors>
      <rdf:Bag>
        <rdf:li rdf:resource="http://example.com/actor/Russel_Crow" />
        <rdf:li rdf:resource="http://example.com/actor/Joaquin_Phoenix" />
        <rdf:li rdf:resource="http://example.com/actor/Connie_Nielsen" />
      </rdf:Bag>
    </lb:actors>
    <lb:year>2000</lb:year>
  </rdf:Description>

```

```

  <rdf:Description rdf:about="http://example.com/mylibrary#Gladiator">
    <lb:title>Forest Gump</lb:title>
    <lb:director>Robert Zemeckis</lb:director>
    <lb:actors>
      <rdf:Bag>
        <rdf:li rdf:resource="http://example.com/actor/Robin_Wright" />
        <rdf:li rdf:resource="http://example.com/actor/Tom_Hanks" />
      </rdf:Bag>
    </lb:actors>
    <lb:year>1994</lb:year>
  </rdf:Description>

```

```
</rdf:RDF>
```

### Namespace:

```

<rdf:Property rdf:about="http://www.example.com/mylibrary#author">
  <rdfs:isDefinedBy rdf:resource="http://www.example.com/mylibrary#" />
  <rdfs:label>author</rdfs:label>
  <rdfs:comment>The subject is an author of item.</rdfs:comment>
  <rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class" />
  <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource" />
</rdf:Property>

```

```

<rdf:Property rdf:about="http://www.example.com/mylibrary#title">
  <rdfs:isDefinedBy rdf:resource="http://www.example.com/mylibrary#" />
  <rdfs:label>title</rdfs:label>
  <rdfs:comment>The subject is an title of item.</rdfs:comment>
  <rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class" />
  <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource" />
</rdf:Property>

```

```

<rdf:Property rdf:about="http://www.example.com/mylibrary#year">
  <rdfs:isDefinedBy rdf:resource="http://www.example.com/mylibrary#"/>
  <rdfs:label>year</rdfs:label>
  <rdfs:comment>The subject is an year when item was published.</
rdfs:comment>
<rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/
>
<rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Resource"/>
</rdf:Property>

```

```

<rdf:Property rdf:about="http://www.example.com/mylibrary#director">
  <rdfs:isDefinedBy rdf:resource="http://www.example.com/mylibrary#"/>
  <rdfs:label>director</rdfs:label>
  <rdfs:comment>The subject is an director of item.</rdfs:comment>
<rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/
>
<rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Resource"/>
</rdf:Property>

```

```

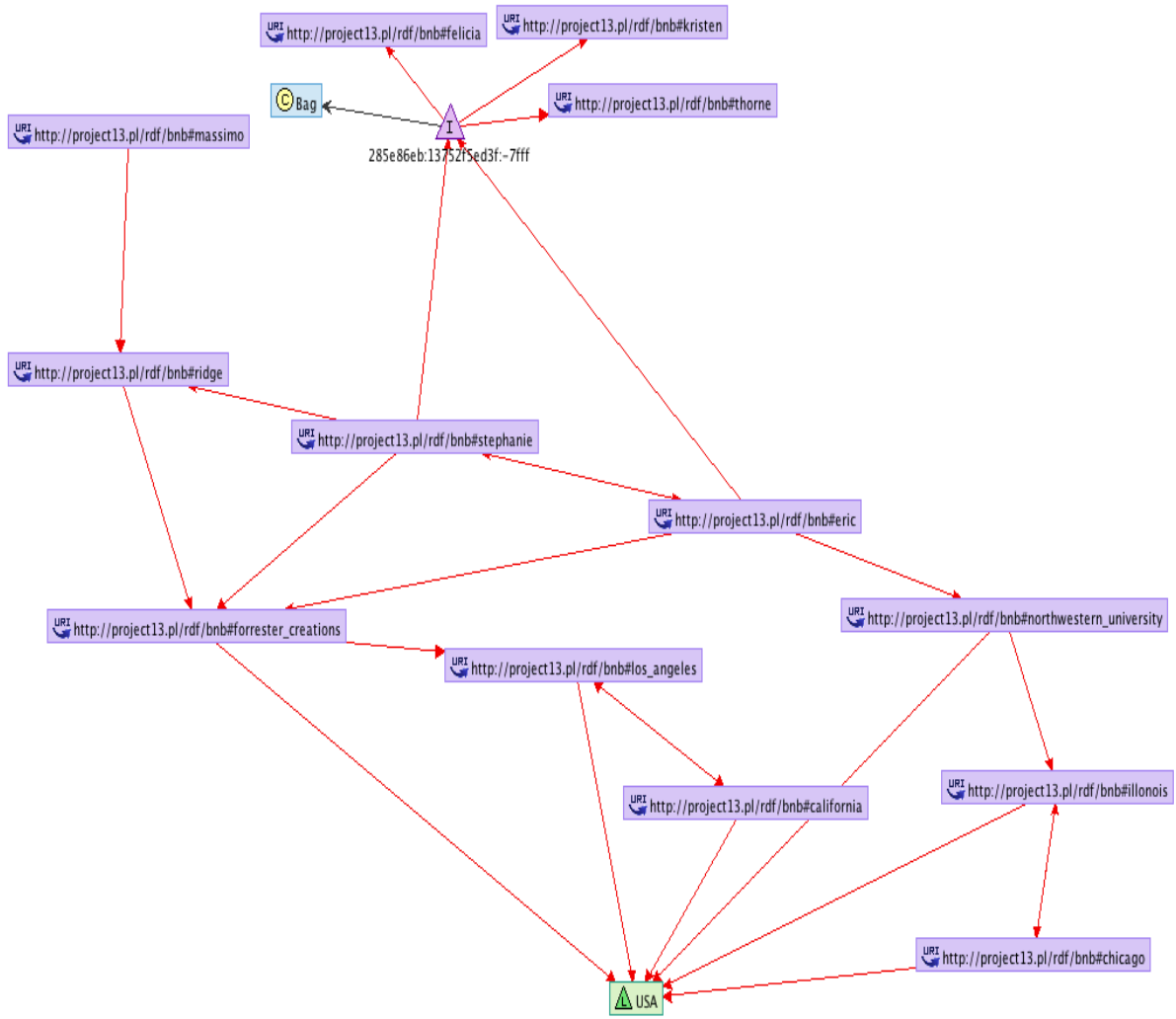
<rdf:Property rdf:about="http://www.example.com/mylibrary#actors">
  <rdfs:isDefinedBy rdf:resource="http://www.example.com/mylibrary#"/>
  <rdfs:label>actors</rdfs:label>
  <rdfs:comment>The collection of actors that played role in move.</
rdfs:comment>
<rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/
>
<rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Resource"/>
</rdf:Property>

```

## 7. RDF Visualization

RDF Gravity, while sufficient for this simple task of showing a very small graph sadly wouldn't be up to the task of displaying real-life data collections - filtering is very limited and no means of data exploration (browsing though nodes) are provided.

Visualization of firs rdf:



Visualization of tasks 4+:

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