Universität Freiburg
Institut für Informatik
Michael Meier
Fang Wei

Georges-Köhler Allee, Geb. 51
D-79110 Freiburg
Tel. (0761) 203-8126
Tel. (0761) 203-8125

Webbasierte Informationssysteme
Winter Term 2010/2011
October 20, 2010

1. Exercise Set: RDF and RDFS

Exercise 1 (RDF/RDFS Syntax)
Consider the following RDF representation:

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:ex="http://example.org/">

<rdf:Description rdf:about="http://example.org/deutschland">
<rdf:type rdf:resource="http://example.org/Land"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/hauptstadt_von">
<rdf:type rdf:resource=
"http://www.w3.org/1999/02/22-rdf-syntax-ns#Property"/>
<rdfs:domain rdf:resource="http://example.org/Stadt"/>
<rdfs:range rdf:resource="http://example.org/Land"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/Land">
<rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
<rdfs:label xml:lang="en">country</rdfs:label>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/berlin">
<rdfs:label xml:lang="en">Berlin</rdfs:label>
<rdf:type rdf:resource="http://example.org/Stadt"/>
<ex:hauptstadt_von rdf:resource="http://example.org/deutschland"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/Stadt">
<rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
<rdfs:label xml:lang="en">city</rdfs:label>
</rdf:Description>

</rdf:RDF>
```

a) What information is encoded in this RDF/RDFS graph? Descrive in your own words.

b) Represent the RDF/RDFS graph graphically.

c) Translate the given RDF/XML document into Turtle syntax.

Exercise 2 (Modelling in RDF)

„The children of Homer are Meggy, Lisa and Bart." Represent this statement in RDF by using

a) an open list, and

b) a closed list.

Use RDF/XML syntax in both cases.

Exercise 3 (Modelling in RDF)

Consider the following statements:

- Romeo thinks that Julia is dead.
- John believes that Mary wants to marry him.
- The dwarf notices that someone has eaten from his plate.

How would you encode this information in RDF? It is sufficient to give a graphical representation only.

Exercise 4 (Modelling in RDF/RDFS)

Encode the following scenario in RDF.

The elementary school of Freiburg has three employees: the two teachers Mr. Maier and Mrs. Schmidt, and the schoolmaster Mrs. Koster. In addition to their administrative duties, Mrs. Koster also does some teaching. In particular, Mr. Maier is assigned to the first-graders, while Mrs. Schmidt and Mrs. Koster together teach the second-, third-, and fourth-graders. Mr. Maier has specialized in sports and therefore is assigned to physical education for all four grades of school. Each grade has a class representative and at least one pupil. Actually, Marie is a fourth-grader. Her favourite subjects in school are physical education, painting, and mathematics.

Use URIs, Blank Nodes, Literals, and RDF containers in your RDF graph. Whenever it makes sense, also use the `rdfs` vocabulary, in particular `rdfs:subClassOf`, `rdfs:subPropertyOf`, `rdfs:domain`, and `rdfs:range`. Finally list the facts that can be derived from your graph according to the RDFS semantics.

Due by: October 27, 2010 before the tutorial starts.