

Due on: **Wednesday 04.07.2007 by 13:00** (via email: tso@ismll.uni-hildesheim.de)

Exercise 11.1

- a) Use the RDF example from the SPARQL lecture, slide (9/21 – A Fresh Example)
- 1) [1 points] Write a SPARQL query that returns all persons having at least 2 children.
 - 2) [1 points] Write a SPQRAL query that returns all persons without children.

- b) Given the following text:

Professor Lars teaches courses: "XML&Semantic Web", "Advanced Artificial Intelligence" and seminars: "Ontology Learning", "Predictive Modeling" and "Recommender Systems".

*"XML& Semantic Web" has 3 assignments: xml, rdf and owl.
"Ontology Learning" has 2 assignments: text classification and Wordnet.*

*Karen attends "XML&Semantic Web" course.
Leandro attends "Ontology Learning" seminar.
Mary attends "Predictive Modeling" seminar.*

Professor Lars supervises Karen, John and Leandro.

- 1) [3 points] Write a RDF in N3 Notation, representing the text given above.
- 2) Write SPARQL queries for the following questions. Please also provide the answer of these queries.
 - a) [2 points] Which courses and seminars does Professor Lars teach?
 - b) [2 points] How many assignments does the course "XML&Semantic Web" have?
 - c) [2 points] Which assignments do Karen, Leandro and Mary have to do?
 - d) [3 points] Which students are supervised by Professor Lars and are attending either a course or seminar?

Exercise 11.2

[6 points] In some spreadsheet application, tables like

| | Europe | USA | Asia |
|------|--------|-----|------|
| 2005 | 105 | 94 | 57 |
| 2006 | 121 | 99 | 44 |
| 2007 | 200 | 13 | 54 |

are captured in RDF documents as follows:

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix : <http://www.cgnm.de/spreadsheet#> .
:Table rdf:type rdfs:Class .
:Row rdf:type rdfs:Class .
:hasColumnNames rdf:type rdf:Property ; rdfs:domain :Table ; rdfs:Seq .
:hasRow rdf:type rdf:Property ; rdfs:domain :Table ; rdfs:range :Row .
:hasRowName rdf:type rdf:Property ; rdfs:domain :Row .
:containsData rdf:type rdf:Property ; rdfs:domain :Row ; rdfs:range rdf:Seq .

:tab1 rdf:type :Table ;
:hasColumnNames [ rdf:_1 "Europe"; rdf:_2 "USA"; rdf:_3 "Asia" ] ;
:hasRow [ :hasRowName "2004"; :containsData [ rdf:_1 "104"; rdf:_2 "94"; rdf:_3 "54" ] ] ,
[ :hasRowName "2005"; :containsData [ rdf:_1 "121"; rdf:_2 "97"; rdf:_3 "65" ] ] ,
[ :hasRowName "2006"; :containsData [ rdf:_1 "133"; rdf:_2 "98"; rdf:_3 "87" ] ] .
```

Now we would like to transpose the table, i.e., interchanges rows and columns to yield the following result in RDF document:

| | 2005 | 2006 | 2007 |
|--------|------|------|------|
| Europe | 105 | 121 | 200 |
| USA | 94 | 99 | 13 |
| Asia | 57 | 44 | 54 |

Is this possible in SPARQL? If yes, write a SPARQL query that transposes the table. If not, explain why this is not possible.