

# INFO-H509: XML & Web Technologies

## Semantic Web Exercises

## SOLUTIONS

Lecturer: Stijn Vansummeren

Assistant: Gilles Dejaegere

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### 1 RDF

#### Exercise 1.1

1. See the included files for the graph drawings.
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4. The triples, written in the turtle syntax for reasons of readability, are the following:

```
@prefix ulb: <http://code.ulb.ac.be/example/terms/> .
@prefix infoh509: <http://code.ulb.ac.be/example/courses/infoh509/> .
@prefix catalogue: <http://code.ulb.ac.be/example/catalogue/> .
@prefix staff: <http://code.ulb.ac.be/example/staff#> .
@prefix infoh509media: <http://cs.ulb.ac.be/public/_media/teaching/infoh509/> .
@prefix dc: <http://purl.org/dc/elements/1.1/> .
@prefix ev: <http://purl.org/rss/1.0/modules/event/>

infoh509:lecture2          ev:location          "UA4.218" .
infoh509:lecture2          ev:startDate          "2009-02-12T10:00:00"^^xs:dateTime .
infoh509:lecture2          ev:endDate            "2009-02-12T12:00:00"^^xs:dateTime .
infoh509:lecture2          rdf:type              ulb:Lecture .
infoh509:lecture2          ulb:teaching_material infoh509media:2-xpath.pdf .
infoh509media:2-xpath.pdf  dc:title              "Cours 2: XPath" .
infoh509media:2-xpath.pdf  dc:creator            staff:svansumm .
```

#### Exercise 1.2

The file `catalog.rdf` is modified as follows. The course INFO-H-200 is added:

```
<rdf:Description rdf:about="infoh200">
  <dc:title>Object Oriented Programming</dc:title>
  <ulb:lecturer rdf:resource="&staff;ezimanyi" />
  <ulb:assistant rdf:resource="&staff;boverhae" />
  <ulb:prerequisite rdf:resoucre="&ulb;infoh100"/>
</rdf:Description>
```

And the prerequisite is added to the course INFO-H-415:

```
<rdf:Description rdf:about="infoh415">
  ...
  <ulb:prerequisite rdf:resoucre="&ulb;infoh303"/>
</rdf:Description>
```

### Exercise 1.3

```
@prefix myconcepts: <http://www.example.org/johndoe/> .
@prefix foaf:       <http://xmlns.com/foaf/0.1/> .
@prefix catalogue:  <http://code.ulb.ac.be/example/catalogue/> .

myconcepts:me      a                foaf:Person .
myconcepts:me      foaf:name        "John Doe" .
myconcepts:me      foaf:mbox        "jd@gmail.com" .
myconcepts:me      myconcepts:has_course catalogue:infoh509 .
```

## 2 RDF Schema

### Exercise 2.1

The following needs to be added to the file `inference.ttl` to state that all personnel members (`ulb:Faculty`) are people (`foaf:Person`).

```
ulb:Faculty      rdfs:subClassOf    foaf:Person .
```

### Exercise 2.2

```
ulb:prerequisite  rdfs:range        ulb:Course .
ulb:prerequisite  rdfs:domain       ulb:Course .
```

**Supplementary exercise:** In a similar vain, still using `rdfs:range` and `rdfs:domain`, add rules that describe the properties `lecturer` and `assistant` in more detail.

```
ulb:lecturer     rdfs:range        ulb:Faculty .
ulb:lecturer     rdfs:domain       ulb:Course .
ulb:assistant     rdfs:range        ulb:Faculty .
ulb:assistant     rdfs:domain       ulb:Course .
```

### Exercise 2.3

```
ulb:workHomepage  rdfs:subPropertyOf foaf:homepage .
```

Note that this property is of type `rdf:Property`, but also of type `rdfs:Resource`. Recall that RDFS comes equipped with a number of standard “axioms” that state, among others, that the domain and range of `subPropertyOf` are `rdf:Property` and that , `rdf:Property` is a subclass of `rdfs:Resource`.

In the file `staff.rdf`, the homepage properties can then be replaced by `workHomePage` as follows.

```
<ulb:Professor rdf:ID="svansumm">
  ...
  <ulb:workHomepage
```

```
        rdf:resource="http://code.ulb.ac.be/code.people.php?id=992"/>
</ulb:Professor>
<ulb:Professor rdf:ID="ezimanyi">
    ...
    <ulb:workHomepage rdf:resource="http://cs.ulb.ac.be/members/esteban/" />
</ulb:Professor>
```