Semantic Web Technologies

Exercise 3: RDFS

3.1. Modeling in RDFS

You are asked to develop an RDF Schema for a library information system. In this system, libraries want to store information about their books, as well as who has lended them. The following information should be expressed:

A library owns books.
Libraries have a name, an address, and a phone number.
Books have a title, one or more authors, and an ISBN number.
Persons have a name, an address, a phone number, and an e-mail address.
Books can be borrowed by a person.

Try to reuse existing schemas you find on the web, e.g., FOAF und Dublin Core:

http://xmlns.com/foaf/spec/20100809.rdf
http://xmlns.com/foaf/spec/
http://dublincore.org/2010/10/11/dcterms.rdf
http://dublincore.org/documents/dcmi-terms/

3.2. Modeling in RDFS

Create an RDF Schema describing family relationships. It should use class and relation hierarchies.

Instantiate your schema by an example in Turtle.
3.3. Reasoning I

Explain why the penguin is wrong:

![Diagram of a penguin thinking about penguins being black and white and old TV shows being black and white, therefore concluding that some penguins are old TV shows.]

3.4. Reasoning II

You are given the following schema:

```rdfs
:Person a rdfs:Class .
:Student a rdfs:Class .
:Student rdfs:subClassOf :Person .
:University a rdfs:Class .
:enrolledAt a rdf:Property .
:memberOf a rdf:Property .
:memberOf rdfs:domain :Person .
:memberOf rdfs:range :University .
:enrolledAt rdfs:subPropertyOf :memberOf .
:enrolledAt rdfs:domain :Student .
```

Furthermore, you are given the statement:

```rdfs
:Jana :enrolledAt :Uni_Mannheim .
```

Show how a reasoner would conclude the following statement:

```rdfs
:Jana a :Person .
```