Classification

One way to make the world more understandable is to classify its objects, i.e. to put them into classes (the apples, the pears, the cars, the human beings, the thoughts, ...)

- RDF objects (resources) can be classified by associating them with classes.
- An RDF class is a resource of type rdfs:Class
- A resource $O$ is an instance of a class $C$ if it has type $C$, i.e. if there is a triple $(O \ rdf:type \ C)$

Example

Represent $ex:doc23.doc$ and $ex:d97.doc$ are articles

1. define a class Article
2. assign type Article to $ex:doc23.doc$ and $ex:d97.doc$

Multi-classification

an object may be an instance of several classes
Structuring the classes : subClassOf

• To better understand the world, organize the classes in a generic/specific hierarchy

• A class C is a subclass of D if every instance of C is also an instance of D

Rem.
1. the subclass relation is transitive
2. if A is a subclass of B and B is a subclass of A then A and B are equivalent

Example

every published article is an article and a publication, and an article is a document

Inferences

RDFS has predefined entailment rules:

<table>
<thead>
<tr>
<th>from</th>
<th>infer</th>
</tr>
</thead>
<tbody>
<tr>
<td>P rdfs:domain C. x P y.</td>
<td>x rdf:type C</td>
</tr>
<tr>
<td>P rdfs:range D. x P y.</td>
<td>y rdf:type D</td>
</tr>
<tr>
<td>P rdfs:subPropertyOf Q.</td>
<td>P rdfs:subPropertyOf R.</td>
</tr>
<tr>
<td>P rdfs:subPropertyOf Q. x P y.</td>
<td>x Q y.</td>
</tr>
<tr>
<td>C rdf:type rdfs:Class. D rdf:type rdfs:Class. E rdf:type rdfs:Class.</td>
<td>C rdfs:subClassOf E.</td>
</tr>
<tr>
<td>C rdfs:subClassOf D. D rdfs:subClassOf E.</td>
<td></td>
</tr>
<tr>
<td>C rdfs:subClassOf D. x rdf:type C.</td>
<td>x rdf:type D</td>
</tr>
</tbody>
</table>

The class and instance levels

It is generally a good idea to have two separate levels
A Modeling Question

Deciding if X should be a class or an instance is a matter of modeling.

ex:Food rdf:type rdfs:Class
ex:pizza rdf:type ex:Food
ex:kebab rdf:type ex:Food
or
ex:Food rdf:type rdfs:Class
ex:pizza rdfs:subClassOf ex:Food
ex:kebab rdfs:subClassOf ex:Food

RDF allows any combination

Predefined classes

rdfs:Resource
rdfs:Class
rdf:Property
rdfs:Literal the set of literal values, eg. textual strings.
rdf:Statement
rdfs:Container, rdf:Bag, rdf:Seq , rdf:Alt

Structuring properties

• Specify the domain and range of a property
  – ex:teaches rdfs:domain ex:professor
  – ex:teaches rdfs:range ex:course

• Specify subproperties
  – ex:motherOf rdfs:subPropertyOf ex:parentOf
Predefined properties

- rdfs:isDefinedBy
- rdf:subject
- rdf:predicate
- rdf:object
- rdf:type (instance of)
- rdfs:member
- rdfs:subClassOf
- rdf:value
- rdfs:comment
- rdfs:label
- rdfs:domain
- rdfs:range
- rdfs:seeAlso
- rdfs:isDefinedBy
- rdf:subject
- rdf:predicate
- rdf:object
- rdf:type
- rdfs:member
- rdfs:subClassOf

Example

The top level

more ...