Representing Knowledge in Prolog and RDFS

This is an example about how to represent ontological information in Prolog. The example uses rules similar to the one for the health insurance example.

Classes are Unary Predicates

Classes can be represented on Prolog as unary predicates. For example:

```
person(mary)
```

can be used to represent that mary is a person. A representation as an ontology triple coud be

```
uw:mary  rdf:type  uw:person
```

(uw is the used as namespace)

Be aware that in Prolog there is no schema. In RDFS one could represent explicitly that uw:person is a class using

```
uw:person  rdf:type  rdfs:Class
```

Properties are binary relations

Properties can be represented on Prolog as binary predicates. For example:

```
age(mary, 60).
residence(mary,italy).
```

can be used to represent that mary ishas age 60 and has residence Italy, which has the following representation as triples:

```
uw:mary  uw:age   "60"
uw:mary  uw:residence  uw:italy
```

Age is a data property and residence is an objective property. The following triples represents the schema information that age and residence are properties.

```
uw:residence  rdf:type  rdf:Property
uw:age  rdf:type  rdf:Property
```

Rules

Rules in Prolog and in SWRL look very similar. In Prolog the head is on the left while in SWRL the head is on the right

Prolog: `risk(P,high) :- disease(Person, heartdisease)`

SWRL: `uw:disease(?p, uw:heartdisease) -> uw:risk(?p, "high")`

Example Knowledge Base

Here you see a Prolog knowledge base and its correspondence in RDFS.

Prolog

```
person(mary).
age(mary, 60).
residence(mary,italy).
disease(mary,heartdisease)

risk(P,high) :- disease(Person, heartdisease)
```

RDFS

```
PREFIX uw: <http://knut.hinkelmann.ch/underwriting#>
```

Facts

```
uw:mary rdf:type uw:person
uw:mary uw:age "60"
uw:mary uw:residence uw:italy
uw:mary uw:disease uw:heartdisease
```

Schema

```
uw:heartdisease rdf:type uw:disease
uw:italy rdf:type uw:country
```

Declaring the classes and Properties

```
uw:person rdf:type rdfs:Class
uw:country rdf:type rdfs:Class
uw:residence rdf:type rdf:Property
uw:age rdf:type rdf:Property
uw:risk rdf:type rdf:Property
uw:disease rdf:type rdf:Property
```