Ex1

An OWL ontology contains the following class hierarchy, properties and individuals:

Class hierarchy

- Place
  - Castle
    - HauntedCastle
  - BedAndBreakfast
  - GuestHouse
  - PerchedHut
- Entity
  - Ghost
  - Tree
- Purpose
  - Providing
- Object
  - Accomodation
  - Breakfast
- Country

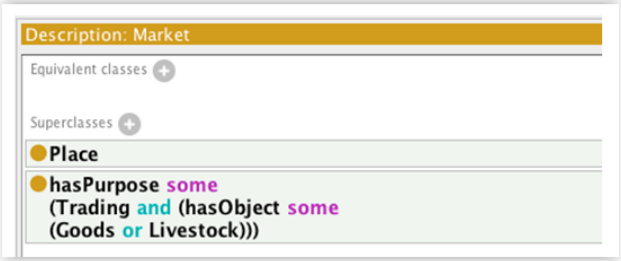
Properties

- locatedIn
- frequentedBy
- hasPurpose
- hasObject

Individuals

- Scotland (of the class Country)

Hint: Here is the description of a Market with a similar vocabulary:



Write axioms to express the following elements of domain knowledge:

1. A haunted castle is a castle frequented by ghosts
2. Every castle located in Scotland is frequented by at least 2 ghosts
3. A bed and breakfast is a place whose purpose is providing accomodation and breakfast and which is located in a guest house
4. A perched hut is a place located in a tree whose purpose is providing accomodation

Ex2

1. Define the vocabulary for representing *roads* and *road lists*
   NB: Remember that a list is composed of a first element (a *road* for a *road list*) and a *rest* which is also a list (the initial list without the first element)

2. Using this vocabulary write axiom(s) for defining a *road list*

3. Define r1, r2 and r3 as specific roads, and axioms for representing:

   - lists containing r2 (in any position)

   - lists containing r3 (in any position)

   - lists containing r2 and r3 (in any position)

   - lists containing r2 in first position

   - lists containing r3 in thirld position.

4. Test yours axioms with the following lists:

   - a list composed of r1 only

   - a list composed of r3 only

   - a list composed of r2 and r1 (in this order)

   - a list composed of r2 and r3 (in this order)

   - a list composed of r1, r2 and r3 (in this order).

Ex3

Using the time ontology described at https://www.w3.org/TR/owl-time/
and available at https://raw.githubusercontent.com/w3c/sdw/gh-pages/time/rdf/time.ttl
define the following proper intervals :

- *Arrive*
- *Arrive_on_time* (for a course and a person)
- *Follow_a_course*
- *Check_email*
- *Check_email_at_right_time* (not during a course)

Hint: a simple way to use the vocabulary defined by the W3C time ontology is to import it into your own ontology. With *Protégé*, go to the *Active ontology* menu then to the *Ontology Imports* and the *Direct imports* tabs.