Projet #2

Ontological Hiking

1. Modelling

Define an OWL vocabulary to represent a tourist area that has a network of hiking trails. Your vocabulary must be sufficient to represent the following objects:

- trails, with their start and end location and their difficulty level (blue, red, black)
- hotels and restaurants and their locations
- hikers and their level (beginner, average, good)
- …

Create 15 non redundant axioms to express domain knowledge including:

1. only good hikers can use black trails
2. red trails are for good or average hikers
3. trails start from and end at exactly one place
4. each place is connected to at least one other place through a trail
5. a person cannot be a good and an average hiker at the same time
6. a restaurant or hotel is located in some place

Use Protégé to create an OWL-2 ontology with your vocabulary and axioms.

2. Query classes

Create additional "query" classes and the corresponding axioms to represent the following sets of objects. Or explain why it is impossible.

- The places that have at least one restaurant
- The places from which one can reach a restaurant by following one trail[1]
- The places from which one can reach a restaurant by following any number of trails
- The places that have a hotel and from which a beginner hiker can reach a restaurant by following any number of trails
- The restaurants that are on a circuit made of at least two trails
- The restaurants from which one can reach another restaurant by following a path that only passes though places that have restaurants
- The hotels that can be reached from place *p* only by good hikers
- The hotels that can be reached from place *p* by following two different routes

Add these axioms to your ontology and add instances to the base classes (representing hikers, trails, places, …) to show that the reasoner infers the expected instances in the query classes.

[1] Trails can be followed in both direction: from start to end or from end to start.