

Projet #2

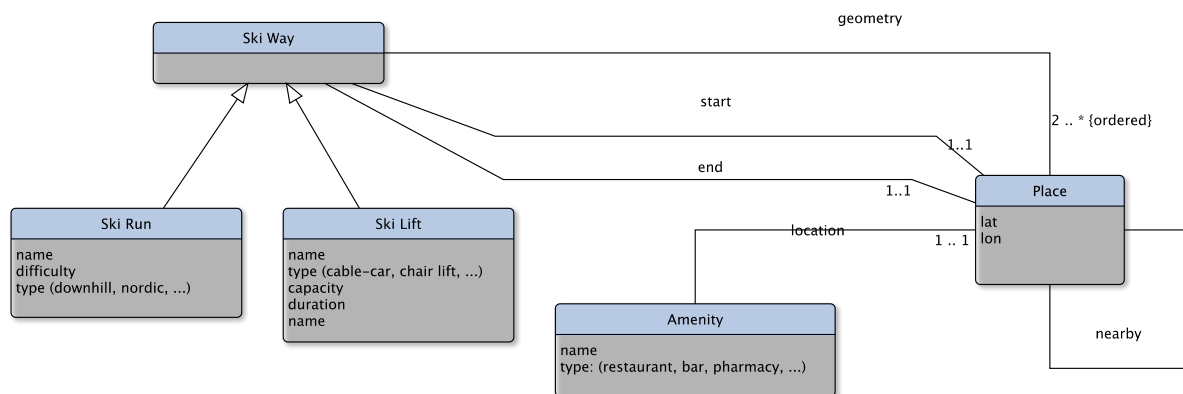
Ontological Skiing

The goal of this project is to create an OWL ontology

- to precisely represent the rules of a domain
- as a support for the automatic inference of implicit facts

1. Modelling an OWL-2 ontology

1. Build an ontology, with the Protégé editor, that represents knowledge about a ski resort. Your ontology must contain classes, properties and axioms that correspond to the following UML diagram.



2. Extend your ontology by defining additional classes, properties, and axioms to represent the following facts:
 - a. *BlueRun* is a ski run that is easy
 - a. *Restaurant* is an amenity of type “restaurant”
 - a. *Quad* is a chair lift with a capacity of 4
 - a. *BeginnerLift* is a ski lift whose end (top) is at or nearby the start of an easy ski run
 - a. *FoodPlace* is a place that is nearby an amenity that serves food (restaurant, fast-food, ...)
 - a. *LiftRestaurant* is a *Restaurant* whose location is nearby the start or end of a ski lift
 - a. *PisteRestaurant* is a *Restaurant* whose location is nearby a ski run (i.e. it is nearby a place that is in the geometry of a ski run)
 - a. *Food2StepsAway* place is a place from which one can reach a *FoodPlace* by taking two interconnected ski ways. Two ways are interconnected if the end place of the first way is the starting place of the second way or is nearby this starting place.
 - a. *FoodNStepsAway* place is a place from which one can reach a *FoodPlace* by taking any number of interconnected ski ways.

Note: to write some axioms you will need to define inverse properties such as *isStartOf* (inverse of *start*), *isEndOf* (inverse of *end*), etc.

3. Run an OWL reasoner to check the consistency of the ontology.

2. Creating a knowledge base

1. Export the ontology in RDF/Turtle and import it in a GraphDB repository with ruleset OWL-RL or OWL-Max.
2. Create an ABox from the data available in the file resort.ttl and load it into your repository (you may need to adapt the property/class names to your ontology). Check that the reasoner correctly found the instances of the classes you defined in 1.2.

Remark. The content of resort.ttl is a direct extract of OpenStreetMap. A SkiWay with `:piste_type "downhill"` corresponds to a ski run (more precisely, it is a segment of an actual ski run but you can consider it as a ski run) A SkiLift is a SkiWay with `:aerialway "cable_car"` or `"platter"` or `"t-bar"` or `"drag_lift"` or `"chair_lift"` or `"magic_carpet"`.

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