

TDT44 Semantic Web Exercises

Fall 2009

A. Review Questions

1. Given the following fragment of an OWL DL ontology

```
<owl:Class rdf:ID="ntnu_skier">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:allValuesFrom>
        <owl:Class rdf:ID="skier"/>
      </owl:allValuesFrom>
      <owl:onProperty>
        <owl:ObjectProperty rdf:ID="hasFriend"/>
      </owl:onProperty>
    </owl:Restriction>
  </rdfs:subClassOf>
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:hasValue>
        <university rdf:ID="NTNU"/>
      </owl:hasValue>
      <owl:onProperty>
        <owl:ObjectProperty rdf:ID="studiesAt"/>
      </owl:onProperty>
    </owl:Restriction>
  </rdfs:subClassOf>
  <rdfs:subClassOf rdf:resource="#skier"/>
</owl:Class>
```

Interpret the definition of NTNU_skier and write a corresponding definition as a natural language sentence.

2. Interpret the following statement in abstract OWL syntax and write the corresponding statement in a natural language sentence.

Class: Debtor

SubclassOf:

Person AND

has some Loan

3. Use OWL Abstract Syntax to define a skiing resort as a rural area that offers at least one skiing opportunity and has minimum two lifts.

Not that rural area, skiing and lifts are all defined as classes.

B. Practical OWL Modeling

Download and install Protégé P4 from Stanford. For the modeling exercise below, use OWL DL as your ontology modeling language.

Case description:

Tourism plays an important role for Trondheim commune. As part of the Wireless Trondheim initiative, the municipality is looking for innovative applications that make use of wireless Internet connection and new smartphones.

We will build a tourist ontology for Trondheim that includes classes, object properties, data properties and individuals (a populated ontology). The idea is that Trondheim commune may classify information according to the ontology and make it available to localized search applications on smartphones.

Build the ontology following the steps below:

- a. List the 10-15 most important tourist attractions in Trondheim and the nearby regions. These should include institutions, activities and events. Identify the necessary infrastructure (accommodation, public transport, etc.) that supports tourists during their stay in Trondheim
- b. Form a class hierarchy in OWL and classify all the instances listed in (a). Specify disjointness where necessary.
- c. Define the data properties of your classes. Note that properties are inherited by the subclasses and should be specified at the highest possible level. Specify the data properties of your individuals.
- d. Define the object properties at the class level and apply them to link your individuals together. Use cardinalities where necessary.
- e. A tourist walk includes at last three attractions that are all within walking distance from the tourist office. Define the class 'Tourist walk' in your ontology.
- f. How would you define different types of tourists in your ontology?
- g. "Festninga" og "Kristiansten" are used as synonyms in Trondheim. How would you model that in your ontology?