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Semantic Web Technologies

Exercise 8: Ontology Engineering

8.1. Tableau Reasoning

Given the following ontology:

```
:Animal owl:disjointWith :Person .
:hasPet rdfs:domain :Person .
:hasPet rdfs:range :Animal .
:Tom :hasPet :Starlet .
```

How does a tableau reasoner conclude that Starlet is not a Person?

8.2. Ontology Engineering

A chess club wants to administrate its data with an ontology. You are given the following specification:

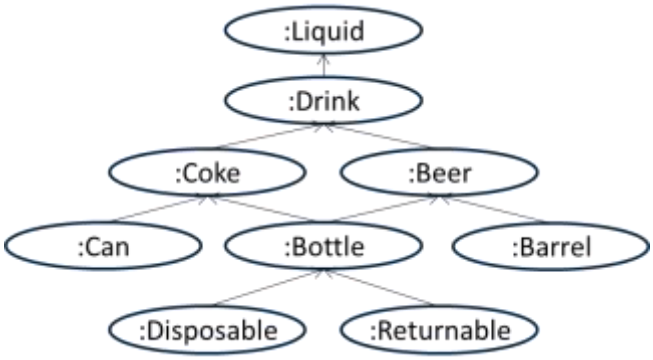
> The chess club has members.
> Every year the club organizes a tournament that consists of several rounds.
> In each round, multiple games are played in parallel, in which two members play against each other.

First, find the basic classes and relations. Next, choose appropriate top classes in DOLCE, and build an ontology based on DOLCE.

https://www.w3.org/2001/sw/BestPractices/WNET/DLP3941_daml.html

8.3. Ontology Debugging 1

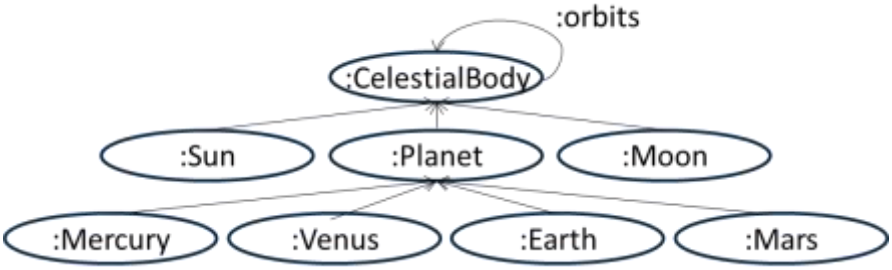
A drink retailer wants to build an ontology based information system for its products. The first draft of the ontology, however, leads to nonsensical inferences:



1. Provide examples for non-sensical inferences.
2. Which OntoClean rule was violated?
3. Rebuild the ontology so that the rule is no longer violated.

8.4. Ontology Debugging 2

The astronomy department has built the following ontology:




```
:Sun     rdfs:subClassOf :CelestialBody.
:Planet  rdfs:subClassOf :CelestialBody.
:Moon    rdfs:subClassOf :CelestialBody.
:Mercury rdfs:subClassOf :Planet.
:Venus   rdfs:subClassOf :Planet.
:Earth   rdfs:subClassOf :Planet.
:Mars    rdfs:subClassOf :Planet.
:orbits a owl:ObjectProperty.
:orbits rdfs:domain :CelestialBody.
:orbits rdfs:range :CelestialBody.
```

Furthermore, they define

```
:orbits :subPropertyOf :attractedBy.
:attractedBy a owl:SymmetricProperty .
:Moon :orbits :Earth .
:Earth :orbits :Sun .
```

The astronomers ask you for advice since the reasoner does not conclude that the moon is attracted by Earth. Instead, they say that an error message is displayed. Why is that? How can they fix the problem?