EXERCISES INF3580 SPRING 2010 WEEK 9

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Figure 1: A bird.

This document contains exercises made for INF3580. Please send any comments, errors, bug or improvement reports to this exercise set to martige@ifi.uio.no. Feedback is most welcome! Alphabetically thanks to Audun Stolpe, Espen H. Lian, Martin Giese and Rune Dahl for feedback.


Keep all the work you do for these exercises in a safe place. Setting up a version control system like cvs, svn or git for the work you do is smart. You can create a svn repository on IfI’s svn server, see their help section for more information. There is also a walk-through from old INF3120 on how to set up a svn repository and connect it to Eclipse, but news is that you’ll need the plug-in subclipse to make it work. Please contact me if you have any smart tips to share.

1mailto:martige@ifi.uio.no
2https://wwws.ifi.uio.no/system/svn/
3https://wwws.ifi.uio.no/system/svn/help.cgi
4http://www.uio.no/studier/emner/matnat/ifi/INF3120/h06/studentarbeider/Prosjektoppgave/SVN_i_Eclipse.pdf
5http://subclipse.tigris.org/
9 Even more OWL

Read

- Semantic Web Programming: chapter 4, 5

9.1 The Simpsons in OWL 2

In this exercise we will extend the family ontology by using OWL 2 vocabulary. OWL 2 adds expressivity to OWL DL without becoming undecidable. For an overview of the new features of OWL 2 see OWL 2 Web Ontology Language: New Features and Rationale.

9.1.1 Exercise

Create a new ontology which imports the family OWL ontology we made in last week’s exercises.

9.1.2 Exercise

State that a person have exactly one gender.

9.1.3 Exercise

Explain what owl keys are. How would you state that fam:hasName is key for Person?

Tip At the time of writing this exercise Protege 4 does not seem to support OWL keys, but claimed in 16. June 2009 to be out with a 4.1. alpha version which will support /the late entry OWL 2 features that didn’t make it into Protege 4.0, e.g., keys/. Protege 4.0 Release – June 16, 2009.

9.1.4 Exercise

Identify the correct characteristics of all properties in the ontology, i.e., which properties are asymmetric, reflexive and irreflexive. Explain what asymmetric, reflexive and irreflexive properties are. Use examples.

http://www.w3.org/TR/owl2-new-features/
http://protegewiki.stanford.edu/index.php/P4_Release_Announcement
Tip Note that the exercise says “identify” and not “add”. The reason for this is that not all combinations of property characteristics are admissible in OWL 2. Adding more property characteristics carelessly will cause reasoners to report errors. For more information see the paper *The even more irresistible SROIQ* by Horrocks et al. SROIQ is the description logic which is the logical basis for OWL 2.

### 9.1.5 Exercise

Explain what it means for two properties to be disjoint. Add the natural disjoint axioms for properties in the ontology.

### 9.1.6 Exercise

Explain what property chaining is. Using property chaining, define the properties

- `fam:hasAunt`
- `fam:hasGrandParent`
- `fam:hasUncle`

as equivalent to the correct property chain.

Create two new properties

- `:hasGrandMother`
- `:hasGrandFather`

in the same manner.

### 9.1.7 Exercise

Define a class *Minor* as a *Person* which is under the age of 18.

Define a class *Juvenile* as a *Person* which is under the age of 16.

### 9.1.8 Exercise

Add a class *Job* and a object property hasJob with domain *Person* and range *Job*.

Define a class *Retiree* as a *Person* which is over 66 years old and has no *Job*.

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