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 and Martin Giese 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.

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1 mailto:martige@ifi.uio.no
2 https://www5.ifi.uio.no/system/svn/help.cgi
3 https://www5.ifi.uio.no/system/svn/help.cgi
4 http://www.uio.no/studier/emner/matnat/ifi/INF3120/h06/studentarbeider/Prosjektoppgave/SVN_i_Eclipse.pdf
5 http://subclipse.tigris.org/
1 Getting started

Each week’s exercises will start by indicating the most relevant chapters from the curriculum to read.

Read

- Semantic Web Programming: chapters 1, 2.

1.1 Software

The task for the first week’s exercises is to install all necessary software packages to get started, and to confirm that everything is set up correctly by running a first semantic web program.

1.1.1 Exercise

First install the latest versions of the following software.

- [Java](http://www.java.com/) SDK
- [Eclipse](http://www.Eclipse.org/) or an editor of your choice
- [Protégé 4](http://protege.stanford.edu/) or equivalent ontology editor
- [Jena API](http://jena.sourceforge.net/)
- [Pellet](http://clarkparsia.com/pellet/)

Note that if you are using a lab computer you can probably skip this exercise; all necessary software should be installed and the Jena API is “included” in the next exercise.

Tip To get Java working properly on Ubuntu I had to follow the instructions on [Ubuntu Linux Install JDK and JRE](http://www.cyberciti.biz/faq/howto-ubuntu-linux-install-configure-jdk-jre/).

1.1.2 Exercise

Read through chapter 2 in the book, set up all software, import project from the book’s homepage[^12] and execute the Hello Semantic Web World project.

Note you don’t need to understand everything in this chapter; but this chapter will give a good idea of what you will learn in this course, and having a functioning system is key for the rest of the course and the exercises.

[^6]: http://www.java.com/
[^7]: http://www.Eclipse.org/
[^8]: http://protege.stanford.edu/
[^9]: http://jena.sourceforge.net/
[^10]: http://clarkparsia.com/pellet/
[^12]: http://semwebprogramming.org/code/Chapter2.zip
1.2 Protégé and the pizza ontology

The set of exercises under this heading is written for the lectures on OWL, but are included here to introduce you to the ontology tool Protégé. This means that there are notions that you are not likely to understand, but try anyway. We will revisit this exercises when you have learnt about OWL.

The pizza ontology is a well-known ontology in the semantic web community. It is developed for educational purposes by the University of Manchester, which is a leading university in the development of semantic technologies.

The pizza ontology and a tutorial that uses it is found at

- http://owl.cs.manchester.ac.uk/tutorials/protegeowltutorial/

The tutorial is primarily for learning how to use Protégé 4. Use it to get help on how to use Protégé in the coming exercises.

1.2.1 Exercise

Open the pizza ontology in Protégé. Take some time to browse the class hierarchy, the property hierarchies and the individuals and note how the ontology describes the domain of pizzas.

1.2.2 Exercise

Find hasIngredient. What is the domain and range of this property? What are the subproperties of hasIngredient? What is the inverse property of hasIngredient? What property characteristics does hasIngredient have?

1.2.3 Exercise

Find Margherita and see how it is defined as a pizza with only cheese and tomato topping. Look at the definition of VegetarianPizza. Is a Margherita pizza a vegetarian pizza? Why / why not?

1.3 What is Semantic Web?

1.3.1 Exercise

Here is a list of links to movies or other media about or using semantic web technology.

- TED talk by Tim Berners-Lee
- Tim Berners-Lee on the Semantic Web
- http://data.gov.uk/
- [http://data.gov.uk/faq](http://data.gov.uk/faq)
- [http://data.gov.uk/resources](http://data.gov.uk/resources)

- Twine 2.0, future semantic web powered search, consumer preview\(^\text{16}\) and ontology editor preview\(^\text{17}\).

- Play around with [http://trueknowledge.com\(^\text{1}\)](http://trueknowledge.com), which uses semantic technology. As an example, when I ask the question “is København the capital of Norway?”, true knowledge replies: “No. There were two interpretations of your question, but they both resulted in the same answer. When you said “københavn “, I understood you to mean one of the following: the Danish city of Copenhagen, Københavns Amt, the Danish amt.”—which is quite cool.

- [http://www.semanticuniverse.com/](http://www.semanticuniverse.com/)\(^\text{2}\)

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\(^{16}\) [http://www.youtube.com/watch?v=jWF3m1417Vk](http://www.youtube.com/watch?v=jWF3m1417Vk)

\(^{17}\) [http://www.youtube.com/watch?v=Uto0U1gDaQU](http://www.youtube.com/watch?v=Uto0U1gDaQU)