

Getting started

Read

- Semantic Web Programming: chapters 1, 2.
- Foundations of Semantic Web Technologies: chapter 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 Exercise

First install the latest versions of the following software.

- [Java](#)¹ SDK
- [Eclipse](#)² or an editor of your choice
- [Protégé](#)³ or equivalent ontology editor
- [Jena API](#)⁴

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

1.2 Exercise

Read through chapter 2 in the book, set up all software, import [project from the book's homepage](#)⁵ and execute the Hello Semantic Web World project as explained in the book.

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.

2 Some peaks ahead

This section presents some of the core languages and technologies we will work with in the coming weeks.

¹<http://www.java.com/>

²<http://www.Eclipse.org/>

³<http://protege.stanford.edu/>

⁴<http://jena.sourceforge.net/>

⁵http://media.wiley.com/product_ancillary/1X/04704180/DOWNLOAD/Code%20Package%20with%20Jars%20-%20Chapter%2001-04.zip

2.1 RDF and SPARQL: DBpedia and SPARQL endpoints

DBpedia⁶ is one of the most well-known semantic web projects. It collects structured information from Wikipedia, e.g., like the information in the fact box on the page Norway⁷. This information is represented in the *RDF* data format and is available for querying through a *SPARQL endpoint*. The query language for RDF databases is *SPARQL*.

1. Exercise

Go to <http://dbpedia.org/page/Norway> to see the information DBpedia has collected about Norway.

2. Exercise

Data in RDF format may be *serialized* in different languages. The file <http://dbpedia.org/data/Norway.n3> contains the RDF data displayed on the above page in the RDF serialization *Turtle*. A list of different serialisation formats is available on the top of the page on Norway (Formats).

3. Exercise

The endpoint address of DBpedia is <http://dbpedia.org/sparql>. Go to this address and paste the following simple SPARQL query in the "Query Text" input field:

```
SELECT ?Lang
WHERE {
  dbr:Norway dbo:officialLanguage ?Lang
}
```

The query asks for the official languages of Norway.

2.2 OWL: 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

- <https://protege.stanford.edu/ontologies/pizza/pizza.owl>
- <http://owl.cs.manchester.ac.uk/research/co-ode/>

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. Exercise

Open the pizza ontology in Protégé. Run Protégé on an Ifi linux computer with the command `protege`. The pizza ontology is found in the bookmarks in the "Open OWL ontology from URI" menu.

⁶<http://dbpedia.org>

⁷<http://en.wikipedia.org/wiki/Norway>

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

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?

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?

3 What is Semantic Web?

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

- [Realising the Full Potential of the Web⁸](#) , Tim Berners-Lee, 1997(!)
- [Semantic Web Road map⁹](#) , *A road map for the future, an architectural plan untested by anything except thought experiments.* Tim Berners-Lee, 1998.
- [TED talk by Tim Berners-Lee¹⁰](#)
- [Tim Berners-Lee on the Semantic Web¹¹](#)
- <http://data.gov.uk/>
- <http://www.w3.org/2001/sw/>

⁸<http://www.w3.org/1998/02/Potential.html>

⁹<http://www.w3.org/DesignIssues/Semantic.html>

¹⁰http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html

¹¹<http://www.youtube.com/watch?v=HeUrEh-nqtU>