Master in Computational Logic & Mestrado Integrado em Engenharia Informática
Universidade Nova de Lisboa

Knowledge Representation and Reasoning Systems
First Project (due on October 18)

– Ontology Development –

1 Objective

In this project, we want you to experiment with an ontology editor and its reasoners, and employ what you have learnt so far, in theory, in the development of an ontology. One goal of this project is also to promote your skills to conduct independent unsupervised work. This is why this project is intentionally underspecified. You should keep its goals in mind, and decide how to proceed accordingly.

2 Tasks

To achieve the goals, you should start by downloading and installing the Protégé Ontology Editor (`http://protege.stanford.edu/`), and learn your way around Protégé and its reasoners by following the tutorial at `http://mowl-power.cs.man.ac.uk/protegeowltutorial/resources/ProtegeOWLTutorialP4_v1_3.pdf` (note that the tutorial is for Protégé 4.x). Then, you should create an interesting ontology (extending an existing one, or starting from scratch). Do not get carried away and develop a huge ontology. It should demonstrate interesting use of a reasoner: – ideally, it should be satisfiable. If not, identify problems and efforts made to trace them. Note that an interesting ontology with sensible test procedures that did not quite succeed is preferable over a trivial one with no testing procedures.

As already mentioned, the topic/domain you want to represent is up to you, you should, however take the following indications into consideration:

- Permit some interesting usage of data in your ontology;
- Use at least two description logic constructors that are not part of $\mathcal{ALC}$ and use them when demonstrating the interesting usage of a reasoner;
- Include some general class axiom.

Finally, one possible example is given as follows:

- Extend the university ontology to cover other aspects of the university domain such as:
  - Accommodation – buildings, staff, etc.
  - Eating facilities
  - Study facilities – the library, what it contains, how it is used, who uses it, who works
  - Greater detail on teaching activities – different kinds of labs, lecturers, etc.
  - etc.

3 Deliverables

You should send a single zip file labelled with your student numbers (in groups of two students) to `mkn@fct.unl.pt`. The file should contain:

- The ontology itself
- A report (single PDF file in English or Portuguese) explaining:
  - Purpose and scope of the ontology including limitations and workarounds;

  - The decisions made and the rationale for them;
  - Special features and problems encountered;
  - What you would like to have done, but did not know how to do;
  - What inferences can be drawn;
  - A brief explanation of your choices regarding the given indications to be considered;
  - The testing procedures and whether they were passed;
  - Any additional material you added.

- If you wish, you can add a section to the report with comments and suggestions about this project, and how to improve it.

After the delivery of the project, there will be a short live presentation of the work, where you are expected to describe the ontology, show its features and some tests/reasoning procedures.