



UNIVERSITEIT VAN AMSTERDAM  
INSTITUTE FOR LOGIC, LANGUAGE AND COMPUTATION

# Core Logic

2007/2008; 1st Semester  
dr Benedikt Löwe

## Homework Set # 2

*Deadline:* September 19th, 2006

### Exercise 5 (7 points).

One of the most important journals in philosophical logic was (or is?) the **Journal of Philosophical Logic** (JPL) which has been published under the auspices of the Association for Symbolic Logic (ASL). Recently, the ASL decided to end their contract with the publisher of the JPL. The president of the ASL, Penelope Maddy, wrote an open letter to the members of the ASL announcing that the JPL will be replaced by a new journal called **Review of Symbolic Logic** (RSL). Find this open letter (which is available online) and quote its first sentence (1 point).

Note the difference between “Philosophical Logic” and “Symbolic Logic” in the titles of the two journals. Find the description of the *Aims and scope* of the two journals and compare them. Discuss which areas are represented by one journal but not the other (2 points). Do you think that the choice of the title of RSL appropriately represents the scope of the journal? (Give reasons for your answer, 1 point.)

One of the editors of the new journal RSL recently gave an invited talk in a special session at *Logic Colloquium 2007* in Wrocław in which he commented on the terms “philosophical logic” and “symbolic logic”. He posted the slides of the talk on his webpage. Find the slides of the talk and try to reconstruct what the editor said about the scope of the term “symbolic logic” (3 points).

### Exercise 6 (4 points).

Find the paper “Vagueness and blurry sets” by Nicholas J. J. Smith published in the JPL (either in the library or using the UvA online subscription).

In this paper, Smith gives a detailed account of conceptual modelling of vagueness. You do not have to read the entire paper (which has 71 pages!).

In Section 8.1 (pp. 199-202), Smith describes one particular instance of conceptual modelling when he discusses the interpretation of the conditional in the presence of vagueness. Explain how Smith’s discussions fits into the circular diagram of conceptual modelling, i.e., what is the world,

what the model, what is the experiment, and how can you identify the green, yellow and pink arrows from the lecture slides in his argument (4 points).

**Exercise 7** (5 points).

We start from the formalization of black and white sheep and ownership given in the lecture, and now add dynamics: the sheep population increases over time. Every second sheep gives birth to a new sheep which is owned by the same person that owned the original sheep and has the same colour as its mother.

Formalize this situation properly, giving an operation (“birth cycle”) that transforms a model of the sheep-owner situation into another model of the sheep-owner situation after one birth cycle (3 points).

Prove that if the original model satisfied “no shepherd owns only white sheep”, then also the new model after the birth cycle satisfies this (2 points).

**Exercise 8** (6 points).

Suppose that you are a system administrator of a dictionary server that can translate from English to Dutch and from Dutch to English. Every second the server gets between five and eight requests for translations from Dutch to English and between two and five requests for translations from English to Dutch. The server can only handle one type of requests at any given second and needs three seconds to switch between “English-to-Dutch” and “Dutch-to-English” mode. If in a given mode, it can serve fifteen requests per second.

Formalize this situation by a conceptual model (3 points). Pick some protocol for the server to switch between the two modes, and investigate the statement “It will never happen that a customer has to wait more than 30 seconds for his or her answer”. Prove or disprove this statement for your formalization (3 points).

Note that Exercises 7 and 8 are **modelling** exercises, so there is no “correct” answer to these questions. Some of the natural language notions in the above text (“every second sheep”) will require decisions by the modeller of how to present them in the formal model. You should give brief arguments why you think your choice of formalization is adequate.