## 1. Exploring a Lexical Semantic Resource

In the lecture slides, a number of words in the "Dolphin Document" have been high-lighted blue as "standard common nouns." The WordNet Web Interface (http://wordnet.princeton.edu/perl/webwn) allows, among other things, to search for the complete hypernym chain of an expression. Look up all marked common nouns in the Web Interface, select that sense which is relevant in the context of the document, look up the hypernym chain, and  construct the (possibly not fully connected) graph that contains all marked common nouns. You need not take over every node from the WordNet hypernym chain, but only those ones that you consider to be the more im-portant ones. All branching nodes and all nodes representing unique beginners (see slide) should be taken into account, however. If you run into intuitive decision prob-lems (which sense is really relevant, whether to treat compounds such as "bottlenose dolphin" as one word), try to decide pragmatically (this is what you are forced to do in lexical semantics every minute). Comment on difficulties with the procedure, prob-lems with WordNet (if any)?

## 2. Formalising natural-language sentences

Give formulas of first-order predicate logic that represent the truth conditions of the following sentences as closely as possible. You can ignore tense and use a single predicate symbol to represent several words where appropriate.

1.  John loves Mary.
2.  All students are intelligent.
3.  If Mary attends a semantics course, she is bored or she learns something interest-ing.
4.  Dolphins are mammals that live in the sea.
5.  Every student presents at least one exercise solution in class.

## 3. Textual Entailment

The "Textual Entailment Challenge" is a rather new competition in Language Tech-nology. Participating systems must find out whether, in pairs of sentences, the second one is entailed or can be inferred from the first one. Look at the following four sen-tence pairs, which are taken from RTE'04. Try to find out whether the information contained in the second sentence follows from the first. Describe informally, what consideration led you to your decision, and which pieces of knowledge were needed.

1.  a. Clinton's new book is not big seller here.
    b. Clinton's book is a big seller.

2.  a. Wal-Mart faces huge sex discrimination suit.
    b. Wal-Mart faces a sex-discrimination suit.

3.  a. All genetically modified food, including soya or maize oil produced from GM soya and maize, and food ingredients, must be labelled.
    b. Companies selling genetically modified foods don't need labels.

4.  a. Researchers at the Harvard School of Public Health say that people who drink coffee may be doing a lot more than keeping themselves awake – this kind of con-sumption apparently also can help reduce the risk of diseases.
    b. Coffee drinking has health benefits.