Semantic Theory SS 07 Exercise 05/07/07

1 In the slides to Lexical Semantics I, the content words in the “Dolphin Document” have been highlighted red. The WordNet 2.0 Web Interface (http://wordnet.princeton.edu/perl/webwn) allows, among other things, to search for the complete hypernym chain of an expression.

   a. Look all marked common nouns up in the Web Interface, select that sense which is relevant in the context of the document, look the hypernym chain up, 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 important ones. All branching nodes should be taken into account, however. If you run into intuitive decision problems (which sense is really relevant, whether to treat compounds (e.g. “bottlenose dolphin”) as one word, try to decide pragmatically (this is what you are forced to do in lexical semantics every minute).

   b. Comment on difficulties with the procedure, problems with WordNet (if any)?

2 .The SUMO Ontology Browser (http://sigma.ontologyportal.org:4010/sigma/Browse.jsp?kb=SUMO&lang=en) allows submitting words (as natural language words, not concepts). It returns the WordNet senses. If you click a WordNet sense, it returns the SUMO/MILO concept that corresponds to the closest parent node for that sense in the hypernym chain.

   a. Look the SUMO concepts for the common nouns of the dolphin text up, and extend the WordNet sense graph of Exercise 1 appropriately. This will give you an impression of the density of the ontological hierarchy.

   b. Look into the rules related to the concepts, for some of the words, and try to formulate a non-trivial inference rule that may be helpful in, say, a question answering system.

3 Consider the following fragment of the dolphin text:

   Dolphins are mammals, not fish. They are warm blooded like man, and give birth to one baby called a calf (at a time). They are (highly) sociable animals, living in pods which are (fairly) fluid, (with dolphins from other pods interacting with each other from time to time).

   Try to write down Description Logic axioms that (approximately) represent the information contained in the sentences (do not care about the parenthesized parts). Use the following atomic predicates and roles:

   Dolphin, Mammal, Fish, Warm_blooded, Man, Baby, Calf, Sociable, Animal, Pod, Fluid, Give_birth_to, Live_in

   Difficulties? Comment, please!