Linguistics 280: Problem Set 1

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Instructions. *Complete these problems by the start of class on Wednesday, January 25, 2012. All submitted work must be your own.*

Problem 1. Give two distinct reasons for distinguishing between form and interpretation in an artificial language like propositional logic (PL) that is designed to model meaning in natural language (NL). How is this relationship similar to the relationship between syntax and semantics in NL? How does it differ?

Problem 2. Given that users of NL communicate via utterances, why is the notion of a sentence (in the sense used in linguistics) interesting? Specifically, what does the notion of a sentence allow us to do when analyzing NL meaning that would be difficult or impossible if we tried to base our analysis on utterances alone?

Problem 3. Discuss the reasons why deductive reasoning is better suited to analyzing NL meaning than inductive reasoning is. Your answer should not only mention the pros of deductive reasoning but also the cons of inductive reasoning.

Problem 4. When choosing how to design an artificial language to model NL meaning, what are some aspects of NL that such an artificial language should maintain in order to stay faithful to NL meaning? What are some aspects that should be eliminated from it so that it makes reliable scientific predictions?

Problem 5. With the definition of deductive validity in mind, explain the following in no more than a paragraph:

a. Imagine an argument with a conclusion like $1 = 1$ or some other necessarily true proposition. Would such an argument be deductively valid? Why or why not?

b. Now imagine an argument with premises that contradict each other. Could such an argument be deductively valid? Why or why not?

Problem 6. For each of the following, say whether or not it is a sentence of PL, and if so, what its main connective is:

a. $(\neg\,((A \to B)(B \wedge C)))$

b. $(((P \to Q) \wedge P) \to Q)$

c. $((A \wedge (\neg\, B)) \vee ((B \to C)\neg \to D))$

d. $((A \vee B) \wedge ((\neg\,(C \vee D)) \wedge E))$

e. $(((\neg\, P) \wedge (\neg\, Q)) \leftrightarrow (\neg\,(P \vee Q)))$