Assignment 2: Methodological Preliminaries, Propositional Logic

Ling 324; Fall 2007
Due on Oct. 3 in class

Your answers should be clear and well-organized, and written in full sentences in proper English when asked to provide explanations. Please type your answers, or write VERY neatly.

1. Give the characteristic functions of the following sets with respect to the universe {1,2,3,4}. Specify them first as set of pairs, and then in a notation using arrows.

   (a) { }
   (b) {2}
   (c) {1,4}
   (d) {1, 2, 3, 4}

2. Give a pair of example statements (not used in class) to illustrate the following notions. Explain how the examples you came up with illustrate theses notions.

   (a) Statement B is an entailment of statement A, but not the other way around.

   (b) Statement B is an implicature of statement A.

   (c) Statement A and statement B are equivalent.

   (d) Statement A and statement B are contradictory.

3. Each of the following sentences has two meaning components specified as (i) and (ii). For each of them, say which of these components is a presupposition. Clearly explain your answer.

   (a) Mary also left.
   (i) Mary left.
   (ii) Someone else left.

   (b) John loves only Sue.
   (i) John loves Sue.
   (ii) John doesn't love anyone else.

4. Describe the readings of the following ambiguous sentences. Explain the cause of the ambiguity. Note that (b) has more than two possible readings. All others each have two possible readings.

(a) Every horse didn't jump over the fence.

(b) Luke saw her duck under the table.

(c) Visiting relatives can be pleasant.

(d) They decided to meet on Tuesday.

(e) The first book that John said that Tolstoy wrote is on sale.

(f) My father tells me to work harder than my boss does.

5. (a) Give three examples of vague expressions not used in class and an argument that these expressions are vague rather than ambiguous.

   (b) Give three examples of context-sensitive expressions not discussed in the textbook and justify your answer.

6. Translate the following English sentences into propositional logic formulas. First specify the keys and then, for each sentence, combine those keys using one of the following operators: conjunction, disjunction, conditional, or biconditional. Justify that the propositional logic formula you gave correctly represents the truth conditions of the English sentence.

   (a) Mary will show up only if Fred shows up.

   (b) Mary will be extremely happy but Fred will be surprised.

7. For each statement below, say whether it is a tautology, a contradiction or a contingent statement? Prove your answer using truth tables.

   (a) $(p \wedge \neg p) \vee \neg(p \wedge \neg p)$

   (b) $((p \wedge q) \rightarrow (p \vee r))$

   (c) $(\neg p \wedge \neg(p \rightarrow q))$

   (d) $((p \vee r) \rightarrow \neg p)$

8. Use the laws in the lecture notes on Introduction to Propositional Logic to reduce each of the following statements to $\neg p$.

   (a) $(\neg(p \vee q) \vee \neg(p \vee \neg q))$

   (b) $((p \vee q) \leftrightarrow (\neg p \wedge q))$

9. Prove that sentences (i) and (ii) jointly entail (iii). Do this by using a truth table.

   (i) If Frodo destroyed the ring, then the world will be saved.

   (ii) Gollum stole the ring from Frodo or Frodo destroyed the ring.

   (iii) The world will be saved or Gollum stole the ring from Frodo.