CSE 4/563 Knowledge Representation
Professor Shapiro
Homework 5
Maximum Points: 24
Due: 10:30 AM, Wednesday, February 25, 2009

February 18, 2009

Put your answers in a file named hw5.*ext*, for an appropriate value of *ext*. **Include your name at the top of the file.** Submit that file by executing the Unix command

    submit_cse463 hw5.ext

or

    submit_cse563 hw5.ext

whichever is appropriate for you. The file can be a text file, or produced by some word processing software, but it must be formatted so it is easy to read.

1. (3) Give the resolution refutation proof that

$$A, (B \Leftrightarrow \neg C), D, (E \wedge F) \models ((A \wedge C \wedge E) \vee (B \wedge D \wedge F)))$$

2. For this question, you are to formalize the following argument in Propositional Logic, and have SNARK test it.

    (a) If Larry warns Bob, then there's danger if and only if Larry is not a liar.
    (b) Larry warns Bob by telling him that there's danger.
    (c) If Larry tells Bob that there's danger, then Bob believes that there's danger if and only if Bob doesn't believe that Larry is a liar.
    (d) Bob takes evasive action if and only if he believes that there's danger.
    (e) If there's danger, then Bob gets injured if and only if he doesn't take evasive action.
    (f) Therefore, if Larry is not a liar and warns Bob, but Bob believes that Larry is a liar, then Bob gets injured.

    (a) (6) Give the syntax and intensional semantics of the atomic propositions you use to formalize the above argument.

    (b) (12) Show the translation of sentences (a) – (f) into **either** Standard Propositional Logic (as presented in lecture) **or** in the machine-readable propositional-logic language of SNARK.

    (c) (3) Use SNARK and the query function to show that sentence (f) above is logically entailed by sentences (a)–(e). List below both the input file and the results of your run.