

CSE 4/563 Knowledge Representation
Professor Shapiro
Homework 5
Maximum Points: 24
Due: 10:30 AM, Wednesday, February 27, 2008

February 20, 2008

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 $P, (V \Rightarrow \neg M), ((P \vee S) \Rightarrow M) \models \neg V$
2. For this question, you will 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.