

# CSCI/PHIL 4550/6550 Artificial Intelligence

## Problem Set Number 4: Due 11/5/2009 (in class)

**NOTE:** Please use the conjunctive normal form for all resolution proofs.

1. [10 points] Solve problem 8.7 page 269 in Russell and Norvig.

2. [10 points] Solve problem 8.8 page 269 in Russell and Norvig.

3. [30 points] Consider the following facts:

- The members of the Elm St. Bridge Club are Joe, Sally, Bill, and Ellen.
- Joe is married to Sally.
- Bill is Ellen's brother.
- The spouse of every married member of the club is also a member of the club.
- The last meeting of the club was at Joe's house.

(a) Represent these facts in first-order logic.

(b) From the facts given above, most people would be able to decide on the truth of the following additional statements:

- The last meeting of the club was at Sally's house.
- Ellen is not married.

Can you construct resolution proofs to demonstrate the truth of each of these statements given the five facts listed above? Do so if possible. Otherwise, add the facts you need and then construct the proofs.

4. [30 points] Assume the following facts:

- Steve likes easy courses.
- Science courses are hard.
- All the courses in the basketweaving department are easy.
- BK301 is a basketweaving course.

Use resolution to answer the question: "What course would Steve like?"