Homework 7: Prolog and Logic Programming

This homework is due April 29, 1991, (by 5:00 PM).

Test your programs using the `prolog` command on Unix, which is the interpreter described in Appendix G. Put your prolog code for the standard problems in `hw7.l`. Hand in a print-out of the code along with your answers to other problems, and please put your name on both. (If you do extra-credit problems, please write the names of the file(s) where the source code for your solutions can be found on your print-out.)

1. (9 points) Do problem 6 on page 404 of the text.
2. (6 points) Code the following facts and rules in Prolog:
   - CLU is a good language.
   - You know how to program in Scheme
   - If you know how to program in language X, and X is a good language, then you program well.
   - If you know how to program in Scheme, then you know how to program in CLU.

   Now using the above facts and rules, answer the following query (by using Prolog, that is, write a query). Do you program well?
3. (10 points) Do problem 7, parts (a) and (b) on page 404 of the text.
4. (extra credit only) Do problem 7, parts (c) and (d) on page 404 of the text.
5. (20 points) Translate the problem statement (i.e., the specification) of problems 3 and 4 from the CLU homework (homework 6) into Prolog. Is your translation executable? Does your translation (as a formal specification) have advantages over the problem statement? Describe them if there are any. What problems with the problem statement does your translation point out?
6. (extra credit only) Is it possible to write a useful version of `combine` in Prolog? Why or why not?
7. (extra credit only) Do problem9 in section 8.8.2 of Kamin's book. You will find the source for the prolog interpreter in

   ```
   /home/cs342/public/src/chap.8/prolog.p
   ```

   Make a copy using the Unix `cp` command and then edit your copy. Turn in differences (using the Unix command `diff`) as before.