

Due: May 7

GENERAL DIRECTIONS: This is a team project. Each team must have 2 or 3 team members. In this project you will write, compile and run three Prolog programs. Use SWI-Prolog. You must turn in the source code and the sample runs pasted onto the end of the source code. I recommend that you cut and paste your program onto a WORD document before printing it. Your name should be embedded in the source code as a comment. Your source code file must be project5.pl .

Problem 1. (10 pts) (Each individual will test the program on his own family database)

- Create a Prolog database of your family tree back to your great grandparents (Based only on *parent*, *male*, *female* facts. Do not add marriage facts). Add parent, male and female facts as needed if your family is small or unknown. Similar to our Ancestor DB but for your family. Draw a graph of the family tree.
- Add relationship rules for ancestor, grandparent, grandfather, grandmother, mother, father, aunt (including all generations of aunts), uncle (including all generation of uncles) , cousin, sister, brother and descendant.
- Add a rule for relative. X and Y are relatives if they have a common ancestor or a common descendant **or if X is an ancestor of Y or if Y is an ancestor of X.**
- Test your Prolog program. All rules should be tested at least once.

Problem 2. (10 pts)

- Write a Prolog program to solve the 6 by 6 Sudoku puzzle distributed in class. Do not use a solution downloaded from the Internet or elsewhere. Write your own. It should be designed along these lines: Label the squares X1, X2, ..., X36 as discussed in class. The X1,..., X36 represent the 36 squares in the Sudoku puzzle (row by row). Set the known values of the X's and then generate needed permutations and test for compliance with problem constraints. Your query should be
sudoku (X1,X2,X3,X4,X5,X6,X7,X8,X9,X,X11,X12,X13,X14, X15,X16,X17,X18,X19,X20,X21,X22,X23,X24,X25,X26,X27,X28,X29,X30,X31,X32,X33,X34,X35,X36).

The result will be values for X1, ... , X36 that solve the problem. Find all possible solutions. Your program should be general, in the sense that it could be easily modified to handle another 6 by 6 Sudoku problem.

- Your program should run in less than a 2 minutes. If it takes a “long time” try to speed it by checking more constraints earlier in the program. You should be able to get your program to run is less than a minute.

Hard Copy Turn in: (Due May 7 in class)

- a. Title Page with team member names, date and project #
- b. Source code file that contains all code for Project#5 : project5.pl
- c. Family tree and tests results for Team Member #1 for Problem 1
- d. Family tree and tests results for Team Member #2 for Problem 1
- e. Family tree and tests results for Team Member #3 (if there is one) for Problem 1
- f. Team test results for Problem 2
- g. Clip or staple all pages together in above order. Grade on Problem1 depends on all team members submitting their family tree and test results.

Electronic Copy Turn in: (Due 7am on May 7)

Upload a single source file called project5.pl with all of your Prolog programs to Moodle. Your source file should contain as a comment all team member names, date and Project #.