Comp 333 Project #4 (25 pts) Spring 2018

Due: April 26

**GENERAL DIRECTIONS:** In this project you will write, compile and test an ancestor program. Use SWI-Prolog. This is an individual project. Your source code file must be called ancestors.pl.

Create a Prolog database of your family tree back to at least one of your great-grandparents. (Based only on *parent, male, female* facts. Do not add marriage facts). If your family is large, use a subset of your family tree. Draw a graph of the family tree.

* Add relationship rules for grandparent, grandfather, grandmother, mother, father, sibling (share at least one parent) , aunt (female sibling of a parent), uncle (male sibling of a parent), sister, brother, ancestor (direct ancestors) and descendant (direct descendants).

//Use setof to do the following problems.

1. Add a rule that finds all parents of X. Usage: findParents(X,L) puts all of the known parents of X in the list L. Do not assume that X has exactly 2 known parents.
2. Add a rule that finds all grandparents of X. Usage: findGrandparents(X,L) puts all of the known grandparents of X in the list L. Do not assume that X has exactly 4 known grandparents.
3. Add a rule that finds all of the children of X. Usage: findChildren(X, L) puts all of the known children of X in the list L.
4. Add a rule that finds all of the siblings of X. Usage: findSiblings(X, L) puts all of the known siblings of X in the list L.
5. Add a rule that finds all of the ancestors of X. Usage: findAncestors(X, L) puts all of the known ancestors of X in the list L.
6. Add a rule that finds all of the descendants of X. Usage: findDescendants(X, L) puts all of the known descendants of X in the list L.
7. Add the ancestorPath rule below to your file. Run ancestorPath rule. What does it do? Explain the logic of the predicate.

ancestorPath(X,X,[X]).

ancestorPath(X,Y,[X|T]) :- parent(X,Z), ancestorPath(Z,Y,T).

* Test your Prolog program thoroughly. For testing purposes, make up family members if you are missing categories.

**Individual Hard Copy Turn in:** **(Due April 26 in class)**

1. Cover page with name, course , project # and date
2. Source code ancestors.pl with your name embedded. Source code should include all of your Prolog rules, the ancestorPath rule and your ancestor database.
3. Your neatly drawn ( or computer generated) family tree.
4. Explain ( typewritten) what the ancestorPath rule does. Explain the logic of the rule. (See item 7).
5. Sample run to turn in. Test rules 1 – 6. only for X = *oneOfYourParents.* Test rule 7 for one of your great grandparents and you. Label test cases.

**Electronic Copy Turn in: (Due 9am on April 26)**

Upload a single source file called ancestors.pl with all of your Prolog rules and your ancestor database to Canvas. Your source file should contain as a comment your name, course, date and Project #.