PHL451 – Prolog Exercise

In order to complete these exercises please use the SWISH prolog app available at: https://swish.swi-prolog.org

Cut and past the following program in to the program area of the SWISH interface:

woman(pam). woman(liz). woman(ann). woman(pat).

man(tom).

man(bob).

man(jim).

parent(pam,bob). parent(tom,bob). parent(tom,liz). parent(bob,ann). parent(bob,pat). parent(pat,jim).

1. Once you have loaded the program pose the following queries:

?- woman(ann).

?- woman(jim).

?- parent(X,bob).

?- parent(tom,X).

?- parent(X,ann),parent(X,pat).

What are the answers to these queries? Beware, for some queries here might be more than one answer. To get all the answers type a ';' and carriage return at the question mark.

1. Now, using the parent predicate formulate the following Prolog queries:
2. Who is Pat's parent?
3. Does Liz have a child?
4. Who is Pat's grandparent?

(c) Given the above facts, extend the program by writing rules defining the following predicates:

sister(X,Y) -- X is the sister of Y.

son(X,Y) -- X is the son of Y. father(X,Y) -- X is the father of Y. grandmother(X,Y) -- X is the grandmother of Y.

Hint: The following predicate might come in handy: different(X,Y):- not(X=Y). Demonstrate that your program works by posing the following queries:

1. ?- sister(X,pat).
2. ?- sister(X,Y).
3. ?- son(jim,X).
4. ?- father(X,bob).
5. ?- grandmother(X,ann).
6. ?- ancestor(X,jim).

Hand in the source code of your prolog program and a proof of the program execution.

**Extra Credit**: create a rule that defines,

ancestor(X,Y) -- X is an ancestor of Y.

Hint: use recursion.