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:

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

(a) Once you have loaded the program pose the following queries:

```
?- female(ann).

?- female(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.

(b) Now, using the parent predicate formulate the following Prolog queries:

1. Who is Pat's parent?
2. Does Liz have a child?
3. Who is Pat's grandparent?

(c) Given the above facts, extend the program by writing <u>rules</u> 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:

4. ?- sister(X,pat).
5. ?- sister(X,Y).
6. ?- son(jim,X).
7. ?- father(X,bob).
8. ?- grandmother(X,ann).
9. ?- 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.