Prolog Programming Assignment

1) How does the queries in kb.pl files is executed

→

Code :-

```
loves(vincent, mia).
loves(marcellus, mia).
loves(pumpkin, honey_bunny)
loves(honey_bunny, pumpkin)

jealous(X,Y) :-
    loves(X,Z),
    loves(Y,Z).
```

Query1 :- ? - loves(x, mia)

Output : X = vincent
X = Marcellus

Explanation :- Here as we know vincent loves Mia as well as marcellous loves mia. Thus the kb assumes that X is either Vincent or Marcellous

Query 2 :-

?- jealous(X, Y).

Output :- X = Y, Y = vincent
X = vincent
Y = marcellus
X = marcellus
Y = vincent
X = Y, Y = marcellus
X = Y, Y = pumpkin
X = Y, Y = honey-bunny

Explanation :- As there is not constant variable in our query. The query will produce output of every. The query with procedure output of ~~quer~~ every jealous(X, Y) pair on our prolog code. The jealous()' rule follows
jealous(X, Y) :- loves(X, Z), loves(Y, Z)

Initially, X and Y bothe were associated to vincent, i.e, self-association. It then follows ~~reflexive~~ reflexive property for the rest of the prolog cod.

2) How does the queries in lists.pl File are executed?

→ Code :-

```
Suffix(Xs, Ys) :-
    append(_, Ys, Xs).

Prefix(Xs, Ys) :-
    append(Ys, _, Xs).

Sublist(Xs, Ys) :-
    Suffix(Xs, Zs),
    Prefix(Zs, Ys).

nrev([], [])
nrev([H|T0], L) :-
    nrev(T0, T),
    append(T, [H], L).
```

Query1 :-

?- sublist([a, b, c, d, e], [c, d]

Output :- true.

Explaination :- Sublist is a check ~~to ab~~ availability between the two list

A sublist Procedure look For a match between the First element or sublist and the main list. Here [c,d] is the sub-list of the main list [a,b,c,d,e]. As the main list contains the sublist [c,d] the output is true, else the output

would have been false

Query 2 :-

?- suffix([a, b, c], zs)

Output :- zs = [a, b, c]
zs = [b, c]
zs = [c]
zs = []
False.

Explaination :- Suffix in genral eliminates the front elements from a list. Here, by using Suffix procedure, [a, b, c] elements are removed from a and continues until all the elements are removed.

As there are no more elements in the list, the output will be displayed as False.

3) Programing Create a Prolog code to find Factorial of a number?

->

code :-

```
Factorial(0,1).

Factorial(N,F) :-
 N>0
 N1 is N-1
 Factorial(N1,F1),
 F is N * F1
```

Query :- ?- Factorial(6,W).

Output :- W = 720

4) In example data set movies Pl write query string and result of query execution for any 5 tasks:-

→ a) Find the movies released in the year 2000

Query : ?- movie(M, 2000).

Output : M = down_from_the_mountain
M = o_brother_where_art_thou
M = ghost_world

b) In which year was the movie American Beauty released?

Query : ?- movie(american_beauty, Y).

Output : Y = 1999

d) Find the movies released after 1990

Query : ?- movie(M, Y), Y > 1990.

Output : M = american_beauty
Y = 1999

M = barton_fink
Y = 1991

c) Find means released before 2000.

Query : ? - movie (M, Y), Y<2000.

Output : M = american-beauty
Y = 1999

M = anna
X = 1981

M = barton-fink
X = 1991

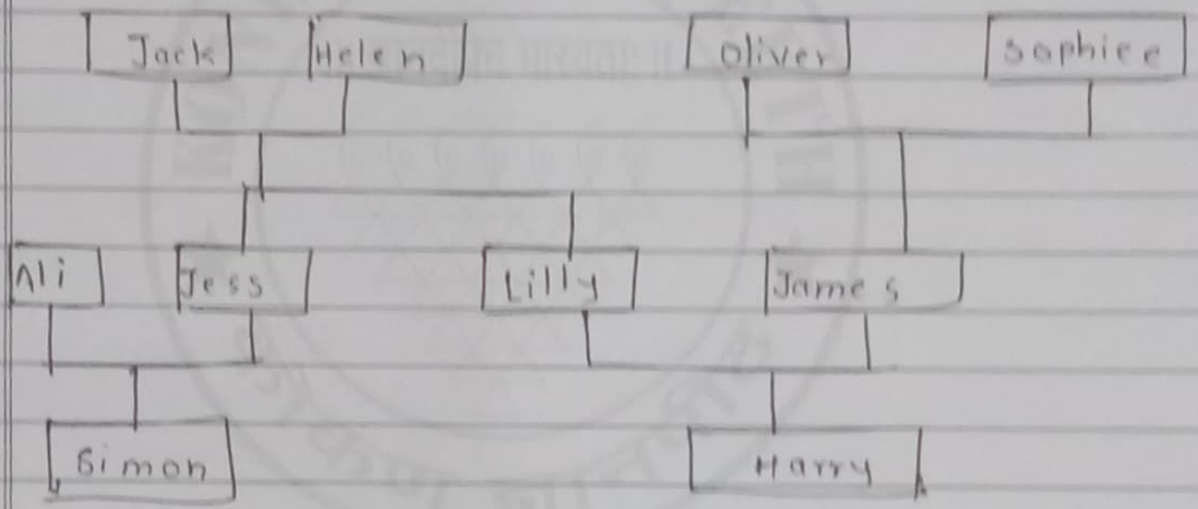
e) Find a director of movie in which scarlett Johansson appered.

Query : ?- actress (M, Scarlett-johansson),
director (M, D).

Owput : D = peter-webber
M = girl-with-a-pearl-earning

5) Draw a family tree of yours any arbitrary family which has the following relations mother, Father, daughter, son, grandson, grandmother, Sibling, uncle, person male, female. You need to convert it into KB and write atleast 6 queries and query result on your KB.

→ Diagram :-



Family Tree.

Query 1 : ?- mother_of(x, jess).

output : x = helen

Query 2 : ?-parent_of(x, simon).

Output : x = jess

Query 3 : ?- sister_of(X, lily).

Output : X = jess

Query 4 : ?- parent_of(X, harry).

Output : X = lily
X = james

Query 5 : ?- aunt_of(X, simon).

Output : X = lily

Query 6 : ?- grandfather_of(x, harry).

output : X = jack