Prolog Programming Assignment

1) How does the queries in kb. pl file are executed

→ Code : loves (vincent, mia).
loves (marcellus, mia)
loves (pumpkin, honey_bunny)
loves (honey_bunny, pumkin)

jealous (x, y):-
loves (x, z),
loves (y, z).

Query 1 : ? - loves (x, mia)
O/p : x = vincent
x = marcellus

Explanation : Here as we know vincent loves
mia as well as marcellus loves mia.
Thus the kb assumes that x is
either vincent or marcellus.

Query 2 :- ? - jealous (x, y).
O/p x = y, x = vincent
x = vincent
y = marcellous
x = marcellour
x = x, y = marcellus
x = y, y = martell pumpkin
x = y, y = honey bunny
x =

Explanation As there is no fixed parameter in
our query.

The query will produce o|p of ~~query~~ every jealous (x,y) pair on our prolog code. The jealous () role follows jealous (x,y):- loves (x,z), loves (y,z).

initially, x and y both were associated to vincent, i.e. self association. It then follows reflexive property for the rest of the prolog code.

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, z)
                 prefix (z, ys)

                 A rev ([], [])
                 A rev ([H|T0], L)
                 Nrev (T0, T)
                 append (T, [H], L)

                 sublist ([a,b,c,d,e], [c,d]).
query : ? -
o|p : True.

Explanation :- A sublist procedure looks for a match bet^n the 1st elements of the sub-list & the main-list. Here, [c,d] is the sublist of the main list [a,b,c,d,e]. As the main list contains the sublist [c,d], the o/p is true. Else, the o/p would have been false.

query 2 : ?. suffix([a,b,c], zs)

O/p :-
zs = [a,b,c]
zs = [b,c]
zs = [c]
zs = []
false

Explanation :- suffix in general 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.

Q.3. Programming : create a prolog code to find factorial of a number?

→ Code :
factorial (0,1):
factorial (N,F) :-
N > 0,
H, is N-1

query = ? - factorid (3,w)

o/p :- w=6

Q.4 In examples data set moves.pl write query strings & results of query execution for any of 5 tasks :

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

query : ? - movie (american_beauty, Y)

o/p :- Y = 1999

b) Find the movies released in year 2000

query : ? movie (M, 2000)

o/p :- M = down_from_the_mountain
M = o_brother_where_art_show
M = ghost_world

c) find movies released before 2000

query : ? movie (m, Y), Y < 2000

O/P :-   M = american - beauty
         Y = 1999

         M = anna
         Y = 1987

         M = barton_fink
         Y = 1991

d] Find the movies released after 1990

Query : ? movie (M,Y) Y<2000 Y>1990

   O/P : M= american_beauty
         Y = 1999
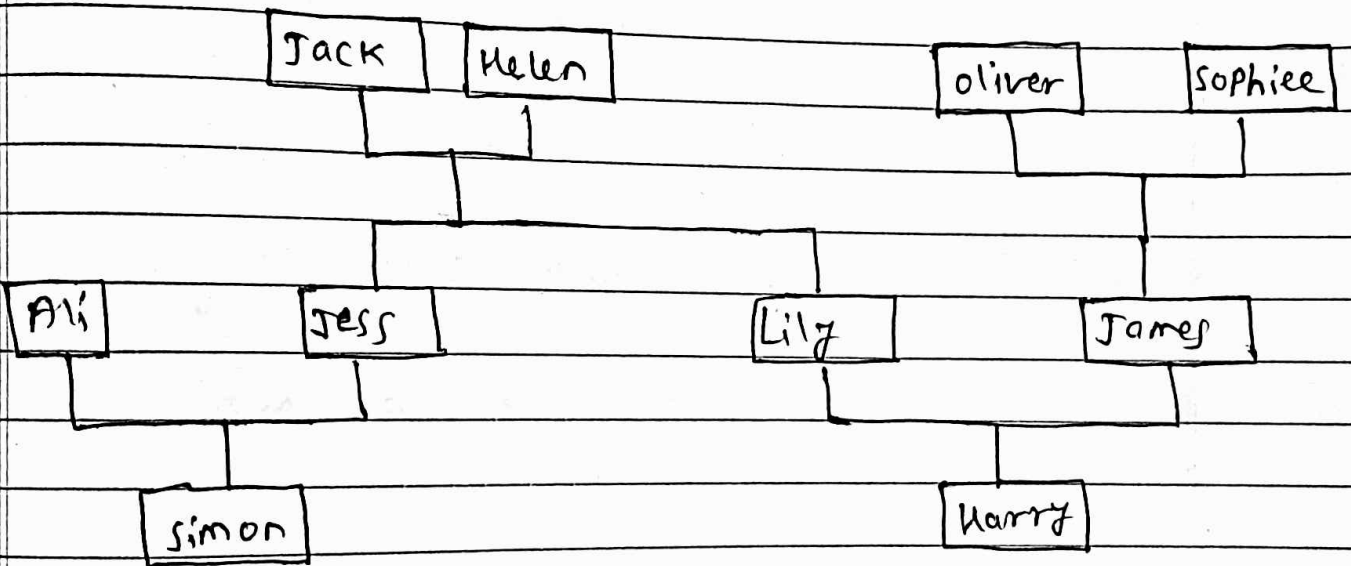
         M= barton_fink
         Y= 1991

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

Query : ? actress (M; scarlett_johnsson)_,
            director (M, o)

   O/P = O = Peter_webber
         M= girl_with_a pearl, earring

Q.5. Draw a family tree of any arbitrary family, which has the following relations mother, father, daughter, son, grandson, grand-mother, uncle, male, female. You need to convert it into KB & write at least 6 queries & query results on your KB.

→ Diagram

family Tree

query 1 : ? mother_of (x, Jess).

    o/p :   x = helen

query 2 : ? parent _of (x, simon)

    o/p : x = jess

Query 3 : ? - sister_of (x, lily)

o|p : x = jess

Query 4 : ? - parent_of (x, harry)

o|p : x = lily
x = james

Query 5 : ? - aunt_of (x, simon)

o|p : x = lily

Query 6 : ? grandfather_of (x, harry)

o|p = x = jack