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, pumpkin).

jealous(x, y) :-
    loves(x, Z),
    loves(y, Z).
```

Query 1: ?- loves(x, mia).
Output: x = vincent
x = marcellus

Explanation: Here as we know vincent loves mia as well as marcellow loves mia. thus the kb assume that x is either Vincent or marcellus.

Query 2: ?- jealous(x, y).
x = y, x = vincent
x = vincent
y = marcellus
x = marcellus
x = y, y = marcellus
x = y, y = pumpkin
x = y, y = Honey_bunny

Explanation : As there is no fixed parameter in our query.
The Query will produce output of every jealous (x, y) pair on our prolog code. The jealous () rule follows
jealous (x, y) :- loves (x, z), loves (y, z)
initially, x & 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 List.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] . [H | T0], L ) :-
    nrev ( T0, T),
    append (T, [H], L)
```

Query 1 : 2- sublist ([a,b,c,d,e], [c,d]).

Output : True

Explanation : A sublist procedure looks for match between the first elements of the 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.

Explanation : Suffix is 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 element are removed. As there are no more elements in the list, the output will be displayed as 'false'

Date :

Q3 Programming 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),
N is N * F1.

Query: ?- factorial (3,w).

Output : w = 6

Q4 In Example data set movies.pl write query string and result of query execution for any of 5 task:

In which year was the mouse American Beauty released?

query : ?- movie (american_beauty, Y).

output : Y = 1999.

b) Find the movies released in year 2000.

Query : ?- movie (M, 2000).
M = down_from_the_mountain
M = O_brother_where_art_thou
M = ghost_world.

c Find the movies released before 2000.

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

output : M = american_beauty
Y = 1999.

M = anna
Y = 1987

M = boston - fink
X = 1991

d) Find the movies released after 1990

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

Output : M = american-beauty
Y = 1999

M = boston_fink
Y = 1991

Find the director of a movie in which Scarlett Johansson appeared.

Query : ?- actress(M, Scarlett_Johansson),
, director(M, D)

Output : D = Peter_Webber
M = girl_with_a_pearl_earring

Q.5 Draw a family tree of you / any arbitary family, which has the following relation mother, father, daughter, Son, grandson, grandmother, sibling, ~~uncle~~ 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