# prolog programming assignment

i) How does the queries in kb.pl file are created?

=) code:-

```
loves (vincent ,mia).
loves (Marcellus ,mia).
loves (pumkin ,honey-bunny).
loves (honey-bunny ,pumkin).

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 Marcellus loves mia. Thus the kb assumes that X is either vincent or Marcellus

Query2 : ?- jealous (X,Y)
output
X = Y , Y = 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 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|TO], L]:-
 nrev (TO ,T)
append (T, [H], L)
```

Query1 : ?-sublist([a,b,c,d,e],[c,d]).
Output : True

Explanation :- A sublist procedure looks for a match between the first elements of sublist & 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 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

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 examples data set movies.pl write query strings and results of query execution for any of 5 tasks.

a) In which year was the movie American Beauty released?
Query :- ? - Movie (american_beauty, Y).
Output. Y = 1999

b) Find the movies released in year 2000

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

c) Find moves released before 2000
query :- ? - movie (M, Y) , Y<2000
Output : M = american_beauty
Y = 1999

M = anna
X = 1987

M = borton_fink
X = 1991

d) find the movies released after 1990.

query: ?- movie (M,Y), Y> 1990.
output: M: american_beauty
Y: 1999

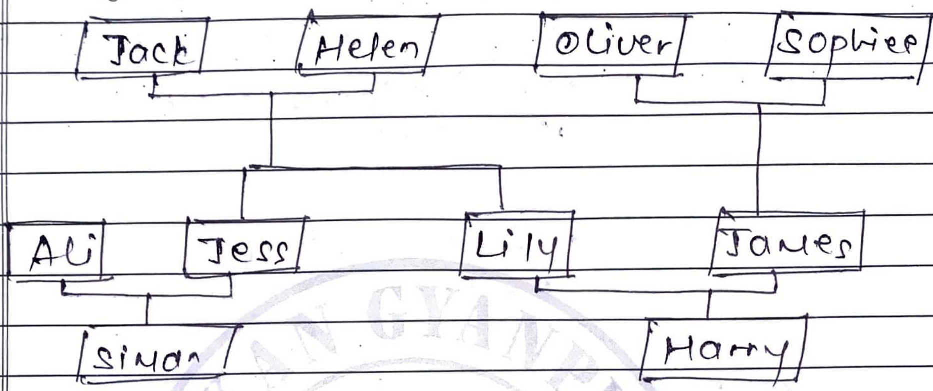
M: barton_fink
Y: 1991

e) Find ~~a~~ director of a movie in which scallett Johansson appeared

Query: ?- actress (M; scarlett_johansson,_),
director(M,D)
Output: D: peter_webber
M: girl_with_a_pearl_earing

Q5) Draw family tree of you/any arbitrary family. which has following relations mother, father, daughter son, grandson, grandmother, sibling, uncle person, male, female, you need to convert it into KB & write atleast 6 queries and query results 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.