

# Prolog Programming Assignment

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1. Programming 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).
```

Query1:- ? - loves(x, mia).

Output:- x = vincent  
          x = marcellus

Explanation :- As we know Vincent and marcellus both of them loves mia. Thus the knowledge Base assumes that x is either Vincent or marcellus.

It says that an individual i.e x will be jealous of an individual i.e y and if there is an individual z that x loves, and y loves that same individual z too. That is it is a concept of Jealousy.

Let let's take another query :-

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 :- From the above query as there are no fixed parameters, the query will produce output of every jealous (x, y) pair in prolog code.

Therefore,

jealous (x, y) :- loves (x, z), loves (y, z)  
 i.e., x and y both were associated to Vincent i.e., self-Association.

2. Programming 2. How does the queries in lists.pl file are executed?

-- Code :-

suffix(Xs, Ys) :-  
     append( \_, Ys, Xs).

prefix(Xs, Ys) :-  
     append(Xs, \_, Ys).

sublist(Xs, Ys) :-  
     suffix(Xs, Zs),  
     prefix(Zs, Ys).



rev([ ], [ ]).

rev([H3|T0], L) :-

rev(T0, T),

append(T, [H], L).

• Query 1 :- ? - sublist([a,b,c,d,c], [c,d]).

Output :- True

Explanation :- A sublist procedure looks for the elements that are present in the elements of sublist and the also in the main list. Here, [c,d] are the elements of the sublist of the mainlist [a,b,c,d,c]. As the main list also contains [c,d], the output is true, if not then it returns false.

• Query 2 :- ? - suffix([a,b,c], zs)

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

zs = [b,c]

zs = [c]

zs = [ ]

Explanation :- Suffix in general eliminates the first element from list until the list is empty. So the output will be displayed as false as there are no elements.

Q.3 Create a Prolog code to find factorial of a number

Factorial (0,1).

Factorial (N,F):-

F > 0

N1 is N-1

Factorial (N1,F1),

F is N \* F1

Query :- ?- factorial (3,w)

output :- w = 6

Q.4. 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 = brother - where - art - thou

M = ghost - world

c. Find the movies released after 1990

- Query :- ?- M = american - beauty

Y = 1999

M = ~~boston-hill~~ ama

Y = ~~1980~~ 1987

e. M = boston-hill

Y = 1991

d. Find the movies released after 1990

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

Output:

M = american-beauty

Y = 1999

M = boston-hill

Y = 1991

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

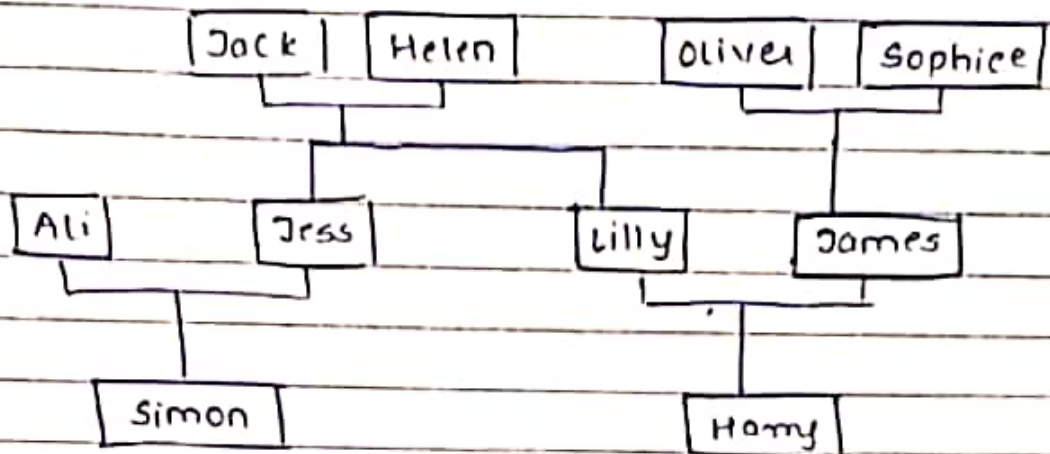
- Query ? - address (M; Scarlett-Johansson -), director (M, D)

Output: D = Peter-webber

M = girl-with-a-pearl-earring

0.5 Draw a family tree of you / any arbitrary family, which has the following relations mother, father, daughter, son, grandson, grandmother, sibling, uncle, niece, male, female. You need to convert it into KB and write atleast 6 queries and query results on your KB.





### \* 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, Lilly).

Output :- x = jess

Query 4:- ?- Parent\_of (x, Harry).

Output :- x = Lilly

x = James

Query 5:- ?- Aunt\_of (x, Simon).

Output :- x = Lilly

Query 6:- ?- Grandfather\_of (x, Harry).

Output :- x = Jack.