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Prolog Programming Assignment

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Prolog Programming Assignment

1. How does the query in kb.pl file are executed?

→

Code : % knowledge bases

```
lovers (vincent, mia)
lovers (marcellus, mia)
lovers (pumpkin, honey-bunny)
lovers (honey bunny, pumpkin).

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

Query : lovers (X, mia)
O/P : X = Vincent
X = marcellus

Explanation: Here as we know Vincent lovers mia aswell as marcellus lovers mia. Thus the kb assumes 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 :

jelous (x,y) : lovers (x, z), lover (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)
        preffix (zs, ys)

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

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

Explanation : A sublist procedure looks for a match between the first elements of the sublist & the main_list. Here [c,d] is the sublist of the main list [a,b,c,d,e]. As the main list containts 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 = [ ]

Explanation : suffix in genral eliminates the front elements from a list, Here, by using suffix procedure, [a,b,c] elements are removed from a & continues until all the elements are removed. As there are no more elements in the list, the output will be displayed as 'False'

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 (N, F1)
N is N * F1

Query : ? . factorial (3, w)

Output : w = 6

Q4] In example data set movies.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)

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_thou
M = ghost-world

c) find movies released before 2000

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

Output : 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 > 1990

output : M = american_beauty
Y = 1999

M = barton - fink.
Y = 1991

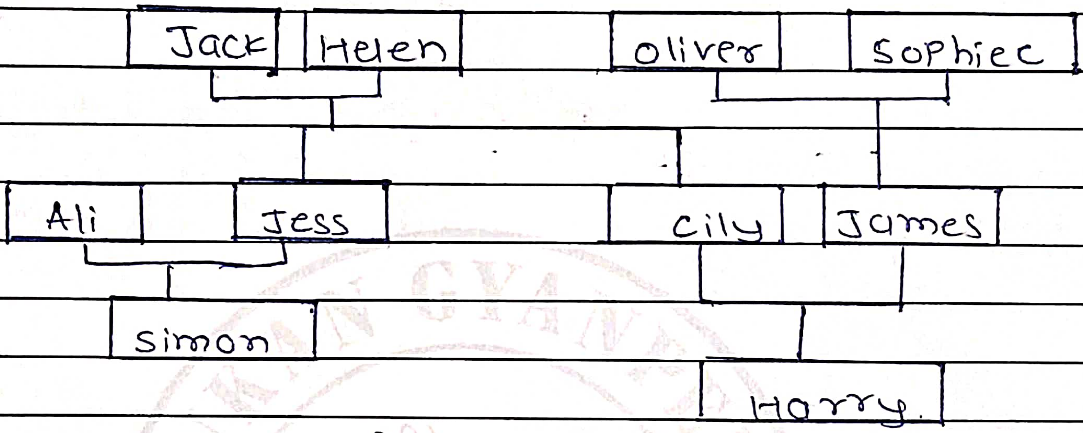
e) find a director of a movie in which Scalett Johansson appeared.

Query : ? - actress (M; Scarlett-Johansson) -)
director (M, O)

output : O = Peter - webber
M = girl - with - a - pearl - earring.

Q5] Draw a family tree of you / 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 & write atleast 6 queries & 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.