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Prolog Programming Assignment

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

→ Query.

loves (X, mia)

o/p → X = vincent
X = marcellus.

code : loves (vincent, mia).
loves (marcellus, mia)
loves (pumpkins, honey, bunny)
loves (honey, bunny, pumpkin)
jealous (X, Y) :-
loves (Y, Z)
loves (Y, Z)

Query : ? loves (X, mia)
output X = vincent
X = marcellus.

Explanation → (In this query mia either loves vincent or marcellus:). so by query and under X can be vincent or marcellus because both loves mia.

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

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Query → jealous (X, Y).

o/p → X = Y Y = vincent.

X = vincent

Y = marcellus

X = marcellus

Y = vincent.

X = Y Y = marcellus

X = Y Y = pumpking.

X = Y Y = honey-bunny.

Explanation =

Query will return self asso. As there is no fixed parameters 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 and Y both were associated to vincent.

i.e. self association it then follows reflexive property for the rest of the prolog code

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2) How does queries in tests.pl file are executed?

→

```
suffix (Xs, Ys) :-
        append (_, Ys, Xs).
prefix (Xs, Ys) :-
        append (Ys, _, Xs).
sublist (Xs, Ys) :-
        suffix (Xs, Zs),
        prefix (Zs, Ys).
mrev ([], []).
mrev ([H|To], L) :-
        mrev (To, T),
        append (T, [H], L).
```

Query 1 →

```
? - sublist ([a, b, c, d, e], [c, d]).
```

o/p → true.

Explanation : If elements c and d are present in the list [a, b, c, d, e] then it returns false.

Here [c, d] is the sub-list of the mainlist [a, b, c, d, e]. As the main list contains the sublists [c, d] o/p is true

Query 2 → ? suffix ([a, b, c], Zs)

o/p → Zs = [a, b, c]

Zs = [b, c]

Zs = [c]

Zs = []

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Explanation → Suffix in general eliminate the front elements from a list. Here, by using suffix procedure [a,b,c] elements are removed from a and continuous until all the elements are removed. As there are no more elements in the list, the o/p will be displayed as 'False'

3) Programming create a prolog code to find factorial of a number

→ Fact

code → Factorial (0,1).

```
factorial (N, F) :-
        N > 0.
        N1 is N - 1,
        factorial (N1, F1);
        F is N * F1.
```

Query → ? factorial (3, W).

o/p → W = 6

4) In example dataset movies pl write query execution for any 5 tasks.

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

→ Query : ? - movie (american_beauty, Y)
o/p : Y = 1999

b) Find movies released in year 2000
Query : ? - movie (m, 2000)
o/p = m : down_from_the_mountain
m = p_brother_where_art_thou
m = ghost_world

c) Find movies realeased before 2000
Query = ? - movie (m, Y), Y < 2000
o/p = m = american_beauty
Y = 1999.
m = 1987.
m = barton_fink
Y = 1991 ...

d) Find the movies released after 1990
Query : ? - movie (m, Y), Y > 1990
o/p m = american_beauty,
Y = 1999
m = barton_fink
Y = 1991..

f) Find a director of a movie in which scarlett Johansson appeared

Query = ? - actress (m, scarlett-Johnson), director (m, D)

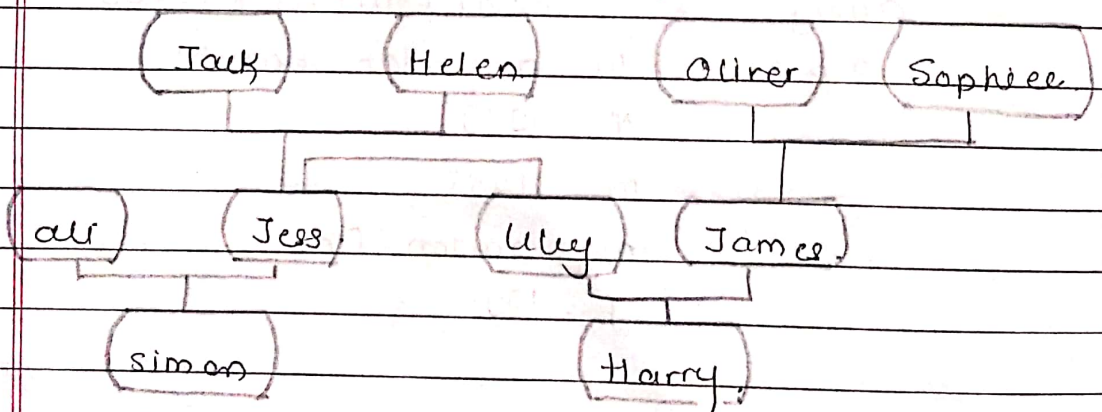
o/p = D = peter-webber

m = girl-with-a-pearl-earring

Programming 5>

Draw a family tree of your/any arbitary family which has following relations mom, dad, daughter, son, grandson, grmother, sibling, uncle, person, male, female. You need to convert it into KB and write atleast 6 queries & query results.

→



→ Query: ? mother-of (x, jess)

o/p: x = helen

Query 2: ? parent-of (x, simon)

o/p = x = jess

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Query 3 : ? - sister-of (x, lily).

o/p

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.