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Subject: Prolog programming Topic: assignment Date: _____

Q1 How does the queries work in lab.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 = ? - loves (X, mia)
Output : X = vincent
X = Marcelus
Explanation : As we know, vincent loves mia as well as marcellus loves mia. Thus the lab assumes that X is either vincent or marcellus.

Query : ? - jealous (X, Y)
Output : X = Y, Y = vincent
X = vincient
Y = marcellus
X = marcellus
Y = vincent
X = Y, Y = marcellus
X = Y, Y = pumpkin
X = Y, Y = honey_bunny

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Explanation: There are no fixed parameters in query. It produces every possible output of jealous (X,Y) in prolog code.
jealous (X,Y) :- loves (X,Z), loves (Y,Z)
Initially, X and Y both were associated to vincent. It follow reflexivity property for the rest of the prolog code.

Q2 How does the queries in list.pl file 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|T0], L) :-
nrev (T0, T),
append (T, [H], L).
```

Query = sublist ([a,b,c,d,e], [c,d]).
Output = True
False

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Query :

Explanation :

A sublist procedure look for a match between the first element of the sublist and the main list. Here (c,d) is the sublist of the main list [a,b,c,d,e]. As the main list contain 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 general eliminate the front element from a list. Here, by using suffix procedure, (a,b,c) element are removed from a and continues until all the element are removed. As there are no more element in the list. The output will be displayed as "false".

Q3 Create a prolog code to find factorial of a number

→ code :

```
factorial (0,1)
factorial (N,F) :-
    N > 0
```

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N1 is N - 1
factorial (N1, F1),
F is N * F1.

Output :

Query : factorial (6, W)
W : 720

04

→ a. In which year was the movie american beauty released?

Query ? - movie (american_beauty, Y)
Output ? Y = 1999

b. Final movie released in year 2000

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

c. Final movie released before 2000

Query = ? - movie (M, Y), Y < 2000
Output : M = american_beauty
Y = 1999
M = anna
Y = barton_fink
Y = 1991 ...

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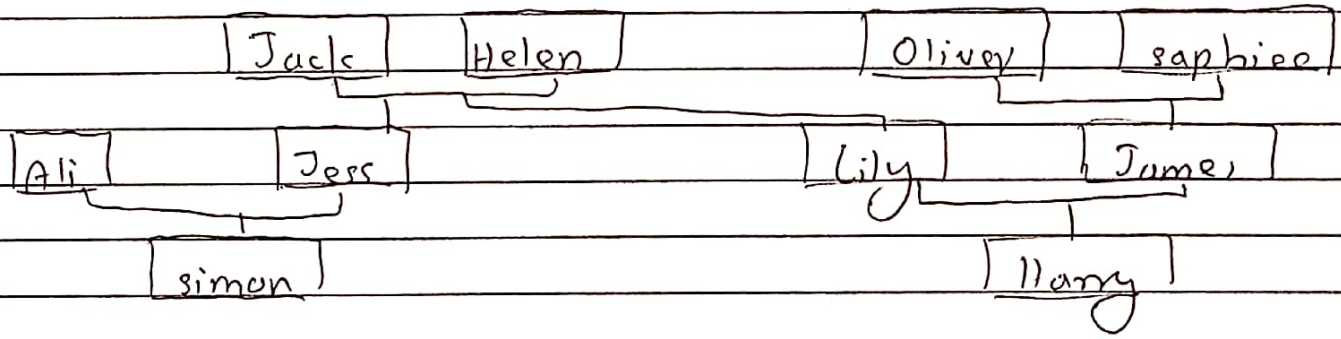
d. Find the movies released after 1990
Query ?- movie (M, Y), Y > 1990
Output : M = american_beauty,
Y = 1999
M = boston_strangler
Y = 1999 ...

e. Find a director of a movie in which scarlett johnson appeared
Query : (actor (_, A, _) ; actress (_, A, _)),
director (_, A).
Output : A = peter_webber
M = girl_with_a_pearl

Q5 Draw a family tree of your any arbitary family which has the following relations mother, father, daughter, son, grandson, grandmother, sibling, person, male, female. You need to convert it into KB and write atleast 8 queries and query result on your KB

→ Diagram:



Family tree

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Query 1 ? - mother of (x, jess)

Output : x = helen

Query 2 : ? - parent_of (x, simon)

Output : x = jess

query 3 : ? - sisler_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 (x, harry)

output : x : jack