Prolog Programming Assignment

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Q.2) How does the queries in kb.pl file are executed?

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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 1 : ?- loves (X, mia)
output : X = vincent
X = Marcellus
Explaination: Here as we know vincent loves mia as well as Marcellus loves mia. Thus the kb assumes that X is either vincent or Marcellus.

Query 2 : ?- jealous (X, Y)
Output : X = Y, X = Vincent
X = Vincent
X = Marcellus
X = Marcellus
X = Y, Y = Marcellus
X = Y, Y = Pumpkin
X = Y, Y = Honey-bunny

Explaination : 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 & Y both were associated to vincent i.e., self association. It then follows relexive property for the rest of the prolog code.

Q.3) How does the queries in lists.pl file are executed!

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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 1 : ? - sublist ([a,b,c,d,e], [c,d]).
output : True
Explaination: A sublist procedure looks for a match between the first elements of the sublist & the mainlist us. Here, [c,d] is the sublist of the mainlist [a,b,c,d,e]. As the mainlist 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
Explaination: Suffix in general 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 out-put will be displayed as 'false'.

Q.3) Programming Create a prolog code to find a 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 1 : ?- factorial (3,W)
Output : W = 6

Q.4) In examples 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 (M1, 2000)
output: M1 = down_from_the_maintain
M1 = O-brother_where-art-thou
M1 = ghost_world

c) Find movies realeased before 2000
Query : ?- movie (M, Y) , Y < 2000
output: M = american_beauty
Y = 1999

M = anna
Y = 1987

M = barton_fink
Y = 1991

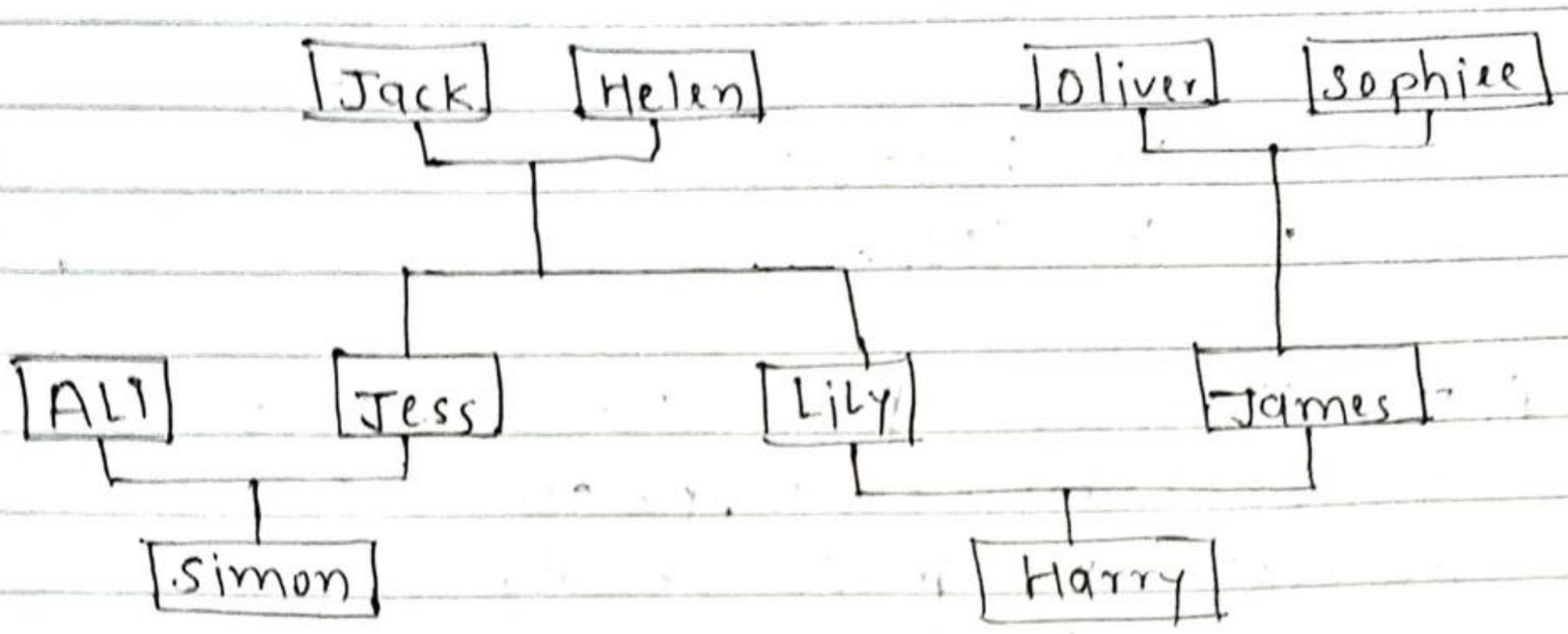
d) Find the movies released after ~~2000~~ 1990
Query: ?- movie (M, Y) , Y > 1990
output: M = american_beauty
Y = 1999

M = barton_fink
Y = 1991

e) Find a director of a movie in which scarleH Johansson appeared
Query: ?- actress (M : ScarleH-Johansson)-), director (M, D)
output: D = Peter_webber
M = girl_with_a_Pearl_earring

Q:5) Draw a family tree of you / any arbitary 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 & queries 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