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Prolog Programming Assignment

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Prolog Programming Assignment

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1) How does queries in Kb.pl File are executed?

→ Code: loves (vincent, mia).
loves (marcellus, mia)
loves (pumpkin, honey-bunny)
loves (honey-bunny, pumkin)

jealous (X, Y):
loves (X, Z).
loves (Y, Z)

Query1: ? - loves (X, mia)
Output: X = vincent
X = Marcellus

Explanation: Here as we know Vincent loves Mia as well as Marcellus loves mia. Thus Kb assumes that X is either Vincent or Marcellus.

Query2: ? - jealous (X, Y)
output 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 are no fixed parameters in our query, it will produce output of every jealous (X,Y) pair on our prolog code. jealous () rule follows:

jealous (X,Y) :- loves (X,Z), loves (Y,Z). So Initially, X & Y both were associated to vincent i.e. self-association. it then follows Reflexive property for rest of prolog code.

2. How does queries in lists.pl file are executed

+) Code: Suffix (XS, YS)
append (_, YS, XS).

Prefix (XS, YS) :-
append (YS, _, XS)

Sublist (XS, YS) :-
Suffix (XS, ZS),

nrev ([], []).
nrev ([H | T0], L) :-
nrev (T0, T)
append (T, [H], L)

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

Explanation: If elements c and d are present in list [a,b,c,d,e] then it returns 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 front elements from list here by using suffix procedure, [a,b,c] elements are removed from a & continues until all elements are removed

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3. Create Prolog code to find factorial of number.

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

Query: ?-factorial (3,w)

Output: w=6

4. In example data set movies.pl write query strings and results of query execution for any 5 tasks.

→ a. In which year was movie American Beauty Released?
Query: ?- movie(american_beauty, Y).
output: Y = 1999

b. Find movies released in year 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 = baxton_fink
Y = 1991 . . .

d. Find movies released before 2000.
Query: ?- movie(M, Y), Y < 2000
output: M = a

d) Find movies released after 1990
Query: ?- movie(M,Y), Y>1990,

Output: M = american-beauty
Y = 1999.

M = barton-fink
Y = 1991

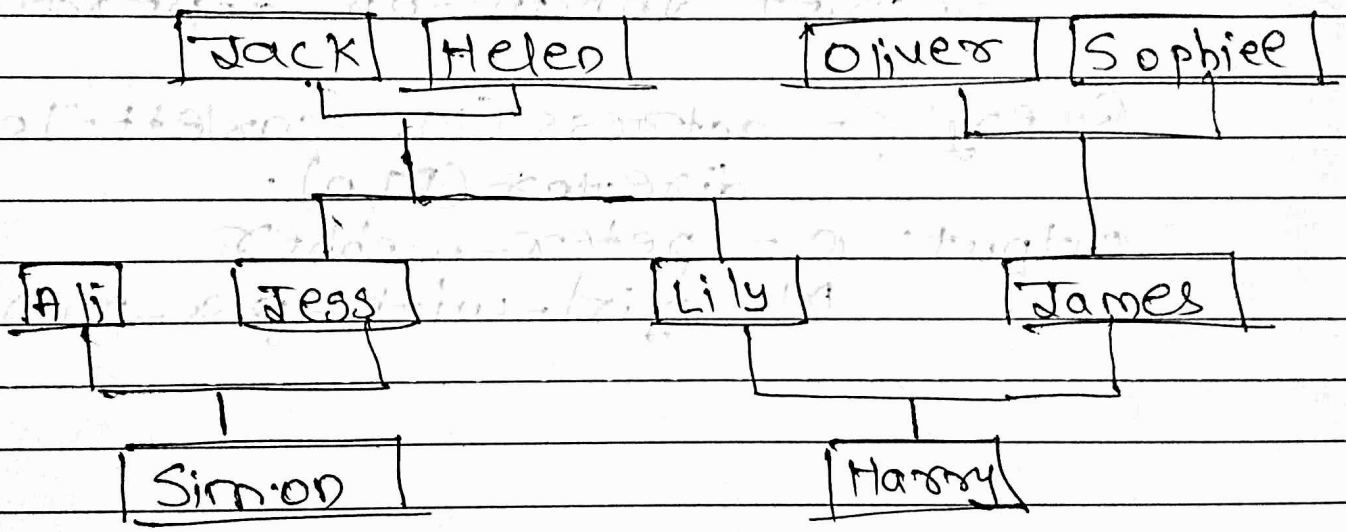
e) find director of movie in which scarlet Johansson appeared.

Query: ?- actress(M, scarlett-Johansson),
director(M,O).

output: O = peter-webber
M1 = girl-with-a-pearl-earrin

Q.5) Draw a family tree of your arbitary family which has following relations mother, father, daughter son, grandson, ~~grand~~ grandmother, sibling, ~~uncle~~ uncle, person, male, female. You need to convert it into KB and write atleast 5 queries and query results on your KB.

⇒ Diagram:



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.