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Prolog Programming Assignment

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Prolog Programming Assignment

Q. (1) How does the queries in kb.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 1: ? - loves (X, mia).
Output: X = Vincent
X = Marcellus.
Explanation :- 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
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 query

will produce output of every jealous (X, Y) pair on our prolog code. The jealous (1) 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 reflexive property for the rest of the prolog code.

Q. (1) How does the 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),
prefix (ZS, YS).

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

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

Explanation :- A sublist procedure looks for a match between the first elements of the sub-list & the main-list if

Here, [c,d] is the sublist & the main list [a,b,c,d,e]. As the main list 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.

Explanation :- 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 output will be displayed as 'false'.

(Q.3) Programming create a prolog code to find factorial of a number?

→ Code : factorial (0,1).
factorial (N,1) :-
N>0,
N1 is N-1,
factorial (N1,F1),
N is N* F1.

Query : ? - factorial (3,W).
output :- W = 6.

D.4 In examples data set movies.pl write query string & results of query execution for any of 5 facts:

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 ~~for~~ before 2000

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

output :- M = American-beauty

Y = 1999.

M = ~~aaaaa~~ ang

Y = 1987

M = boston_fint

Y = 1991

d) Find the movies released after 1990

Query :- movie (M, Y). Y >= 1990.

Output :- M = American-beauty

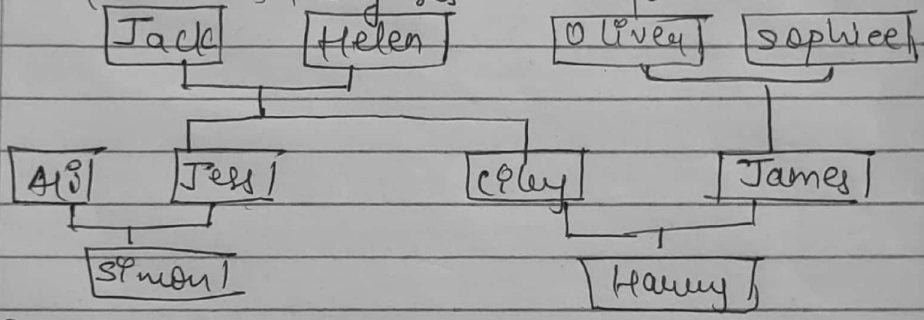
Y = 1999

M = barton_fnt
Y = 1991.

e) Find a director of movie in which scarlett Johansson appeared.
Query :- ? - actress (M, scarlett 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 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.

→



Query 1 :- ? - mother_of (x, jess)
Output :- x = helen.
Query 2 :- ? - parent_of (x, simon)
Output :- x = jess
Query 3 :- ? - sister_of (x, Ely)
output :- x = jess
Query 4 :- ? - parent_of (x, harry)
output :- x = Ely , x = james
Query 5 :- ? - aunt_of (x, simon)
Output :- x = Ely
Query 6 :- ? - grandfather_of (x, harry).
Output :- x = jack