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Department of Information Technology

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Prolog Programing Assignment.

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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)

Query1: ?- 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.

Explaination :- As there is no fixed parameters in our query. The query will produce output of energy jealous (X, Y) pair on our prolog code. The Jealous () rule follows.

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Jealous (X Y) :- loves (X, Z), loves (Y, Z)
initially X and Y both were associated to unicent, i.e, self-association. It then follows reflexive property for the rest of the prolog code.

2] How does the queries in list.pl 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|T], L) :-
nrev (T, 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 sublist and the main-list. Here, [c, d] is the sublist of the mainlist [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.

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

Query : ?- factorial(3,W).

Output :- W=6

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Q.4 In examples data set movies.pl write query strings and 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 (M, 2000).

Output :- M = down-from-the-mountain
M = O-brother-where-art-than
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 = boxton-link
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

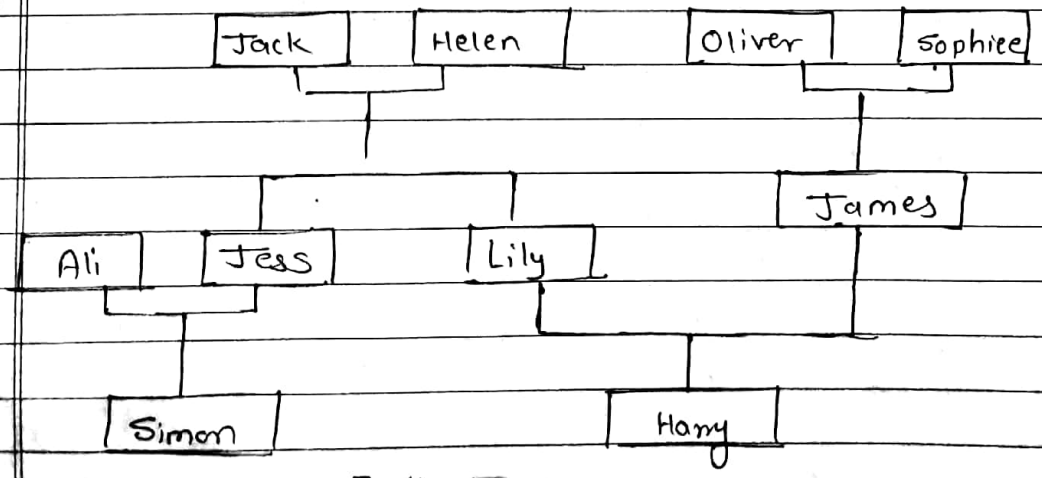
M = barton-fink
Y = 1991

e) Find a director of a movie in which scaleH Johansson append.

Query : ?- actress (m, ScarleH-Johansoon) - director (m, D)
D = peter-webber
m = girl-with-a-pearl-earring.

Q.5 Draw a family tree of you any arbitary family which has the following reactions mother, father, daughter, son, grandson, grandmother, Sibling, uncle, person, male, female. You need to convert it into KB and write atleast 6 queries and Query results on your K.B

→



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 : ?- 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.