

Prolog Programming Assignment

1> How does the queries in kb.p1 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 = 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)
X = y, y = 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 every jealous (X, Y) pair on our prolog code. The jealous $()$ 'not' 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.

27 How does the queries in lists fr are executed?

\Rightarrow Code: Suffix (Xs, Ys) :-
append $(-, Ys, Xs)$.

prefix (Xs, Ys) :-
append $(Ys, -, Xs)$.

Sublist (Xs, Ys) :-
Suffix (Xs, Zs) ,
prefix (Zs, Ys)

reverse $([], [])$.
reverse $([H]T, L)$:-
reverse (T, T)
append $(T, [H], L)$.

Query 1: ? - 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 sub list of 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 is general eliminates the front element from a list. Here by using suffix procedure [a, b, c] elements are removed from a & continued until all the elements are removed. As there are no elements in the list, the output will be displayed as 'false'.

Q3 Programming Create a Pseudocode to find factorial of a number?

⇒ Code : factorial(a, 1).
factorial(N, F):-

$N > 0$,

N_1 is $N-1$,

factorial(N_1 , F_1),

N is $N * F_1$

Query : ?- factorial(3, w).

Output : $w = 6$

Q4 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 : ?- movies(M, 2000).

- Output : M = down-from the mountain
M = O-brother - where - are You
M = ghost-world

c> Find movies released before 2000
 \Rightarrow 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 1990
 \Rightarrow query : ? - movie (M, Y), $Y > 1990$

Output : M = american-beauty
 $Y = 1999$

M = barton-fink
 $Y = 1991$

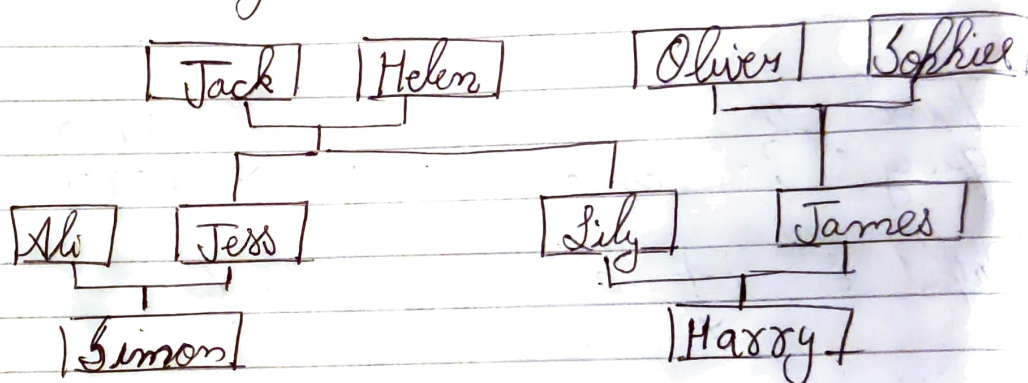
e> Find a director of a movie in which
 Scarlett Johansson appeared.

\Rightarrow Query : ? - actress (M, Scarlett-Johansson),
 director (M, D)

Output : D = Peter-Webber,
 M = girl-with-a-pearl-earring.

Q5 Draw a family tree of a you / any arbitrary family, which has the following relations mother, father, daughter, son, grandson, grandmother, siblings, and uncle. person, male, female. You need to convert it into KB and write atleast 6 queries & query our results on your KB.

⇒ Alt 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 = lilly
x = james

⇒ Query 5: ? - aunt-of (x, simon).

Output : x = lily.

⇒ Query 6: ? - grandfather-of (x, harry)

Output : x = Jack.