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Prolog Programming Assignment

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Q.1] How does the queries in Kb.pl file execute?

⟹ code :-

```
loves (vincent, mia).
loves (marcellus, mia).
loves (pumkin, honey_bunny).
loves (honey_bunny, pumkin).

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

Query 1 : ?- loves (X, mia).
Output 1 : X = vincent
X = marcellus

Explanation : Here as we know vincent loves mia as well as marcellus loves mia. ~~But~~ Thus the kb assumes that X is either vincent / marcellus

Query 2 : ?- jealous (X, Y).
Output 2 : X = Y, Y = vincent
X = vincent
Y = marcellus
X = marcellus
Y = vincent
X = Y, Y = marcellus
X = Y, Y = pumkin.
X = Y, Y = honey_bunny

Explaination : ~~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 ()' rule follows :

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

Initially, X and Y both were associated to vincent,

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i.e. ~~sf~~ self-association.
It then follows Reflexive Property for the rest of the prolog code.

Q. 2] How does the queries in lists.pl files 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 1 : ?-sublist ([a, b, c, d, e], [c, d])
Output 1 : true
Explanation : Essentially, look for a match between the first element of sublist and mainlist using the sublist procedure. When a match occurs, head over to the prelist procedure & checks if this turns out to be a prefix for the remainder of the list. If so, the resolution ends in success.

Query 2 : ~~suffi~~ ?- suffix ([a, b, c], Zs)
Output 2 : Zs = [a, b, c]
Zs = [b, c]
Zs = [c]
Zs = []
False

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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 = barton_fink,

Y = 1991....

d.) find the movies released after 1990.

→ Query : ?- movies(M,Y), Y>1990.

Output : M = american_beauty,

Y = 1999

M = barton_fink,

Y = 1991....

f.) find a director of a movie in which Scarlett Johnson appeared.

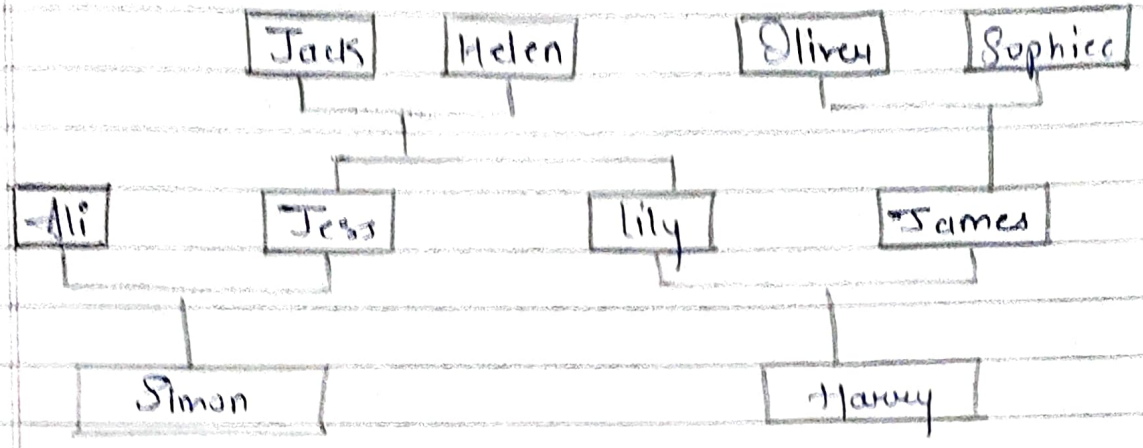
→ Query : ?- actress (M, Scarlett_johnson, _),
director (M,D).

Output : D = peter_webber,

M = girl_with_a_pearl_earring

Q.5] Draw a family tree of you/any arbitrary family. Which was foll. relations mother, father, daughter, son, grandson, sibling, uncle, person, male, female. You need to convert it into KB and write atleast 6 queries and query results on your KB.

→ family tree :



Code :

Query 1 : ?- mother_of (X, jess).
Output 1 : X = helen

Query 2 : ?- parent_of (X, simon).
Output 2 : X = jess

Query 3 : ?- sister_of (X, lily).
Output 3 : X = jess

~~Output~~ Query 4 : ?- parent_of (X, harry).
Output 4 : X = lily
X = james

Query 5 : ?- aunt_of (X, simon)
Output 5 : X = lily

Query 6 : ?- grandfather_of (X, harry).
Output 6 : X = jack