Prlog Programming Assignment

1) How does the queries in kb.pl file are executed?

→ code
```
loves (vincent, mia)
loves (marcellus, mia)
loves (pumpkin, honey-bunny)
lover (honey-bunny, pumpkin)

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

Query 1 - ?- loves (X, mia)
output X = vincent
X = marcellous

Explanation :- Here as we know vincent loves Mia as well as Marcellous loves mia thus the KB assumes that X is either vincent or Marcellous

Query 2 ?- jealous (X, Y)
Output X = Y, X = vincent
X = vincent
Y = Marcellous
X = Marcellous
X, Y, Y = Marcellous
X = X, Y = pumpkin
X = X, 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() rule follows,
jealous(X, Y) :- loves(X, Z), loves(Y, Z)
Initially, X and Y both were associated to vincent, i.e self association. It then follows reflexive property for the rest of the prolog code.

7. How does the queries in list pr 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 sub-list and the main list eg. Here [c,d] is the sub-list of the main list. [a,b,c,d,e]. As the main list containing 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

Explaination:- Suffix in general elimination 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,
N, is N-1
factorial (N, F),
N is N* F.

Query : ?- factorial (3, W).

Output : W = 6

Q4 In examples data set movies, pl write query strings and result of query execution for any of 5 tasks:

a) In which year was the movies American Beauty released
Query : ?- movie (American_beauty, x)
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 before 2000
Query : ?- movie (M, Y) Y<2000
Output : M = American_beauty
Y = 1999

M = anna
Y = 1987

M = barton_fnks
Y = 1991

d) Find the movies released after 1990

Qury = ? - movie (M, Y), Y > 1990.

output M = american_beauty
Y = 1999

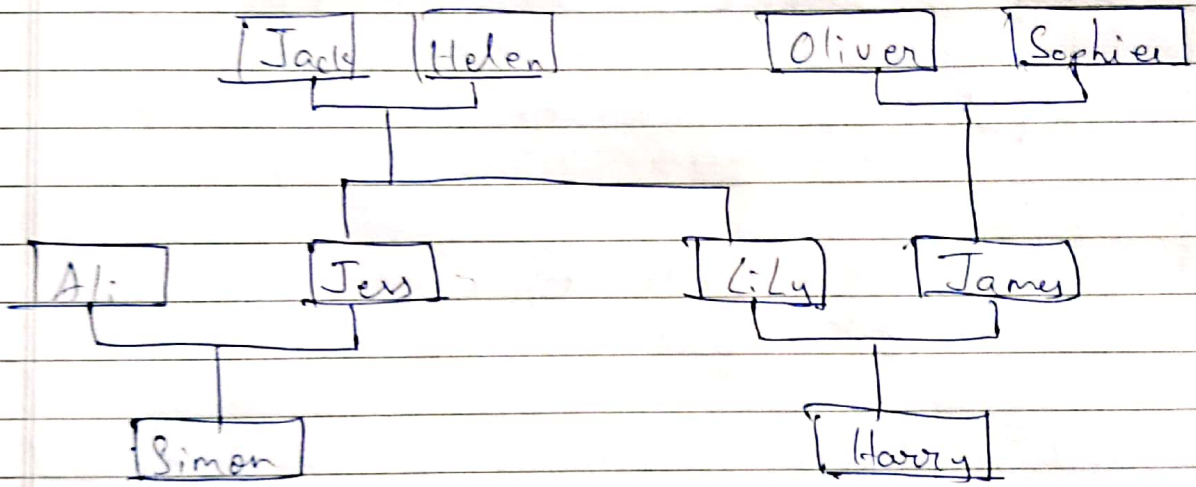
M = barton_fink
Y = 1991

e) find a director of a movie in which scarlett Johnson appeared

Query : ? - actres (M, Scarlette Johnson), director(M,D)
Output :- D = Peter_webber
M = girl_with_a_pearl_earing

Q.5 Draw a family tree of you/any arbitary family, which has the following relations 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 result on your KB

-> Program



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 - jes

Query 4: ? - part 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.