Prolog Programming Assignment

Q1) 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: ?- 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, 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 parameters in our query

The Query will produce o/p 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 & y Both were associated to vincent i.e. self-association it then follows reflexive property for the rest of prolog code.

2) How does the queries in lists.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|T0], L) :-
nrev(T0, T).
append(T, [H], L).

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

Output : True.

Explanation: A Sublist procedure looks for a match b/w the first elements of sublist & 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 o/p is true Else the o/p would have been false.

Query 2 : ? - suffix([a, b, c], zs)
o/p : zs = [a, b, c]
zs = [b, c]
zs = [c]
zs = []
false

Explanation: suffix in General eliminates the front element from a list by using suffix procedure. [a, b, c] element are removed from a & continues until all the element are removed As there are no more elements in the list, the o/p will be displayed as 'false'

Q3) Programming create a prolog code to find factorial of number?

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

Query: ? - factorial (3, w)

output: w = 6

Q4) In Example data set movies.pl write query strings & results of query execution for any of 5 tasks

a) In which year was the movie American Beauty released?
query: ? - movie (american_beauty, y)
o/p: y = 1999.

b) Find the movie released in year 2000
query: ? - movie (m, 2000)
o/p m = clown from the mountain
m = O - brother - where - art, thou
m = ghost - world.

a) 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 movie released after 1990

Query? - movie(M, Y) Y>1990

o/p M = american_beauty
Y = 1999

M = barton-fink
Y = 1991

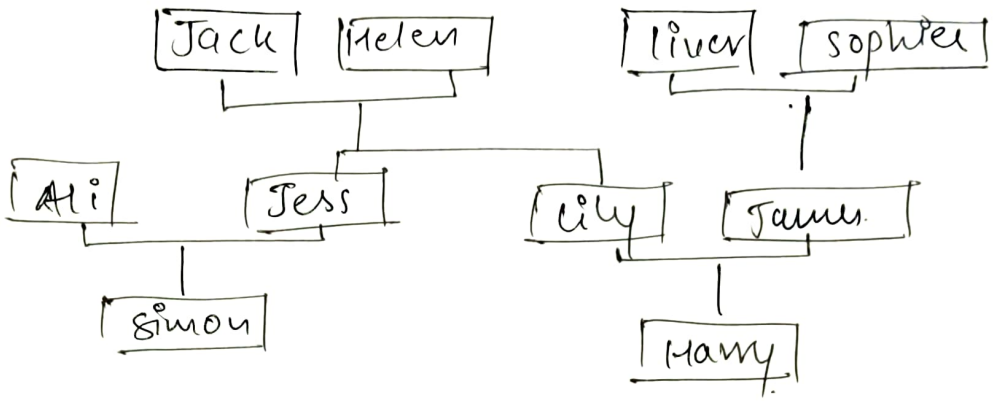
c) Find a director of a movie in which scalett Johansson appeared.

Query?- actress(M, scarlett-johansson), director(M, D)

output: D = peter-webber
M = girl_with_a_pearl_earring.

Q5) Draw a family tree of you/any arbitrary family which has the following relation ships father, daughter, son, Grandson, Grandmother, sibling uncle, person, male, female. You need to convert it into KB and write atleast 6 queries. & query result on your KB.

-> 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 = lily
x = james.

Query 5: ? - aunt - of (x, simon)

output: x = lily

Query 6: ? grandfather-of (x, Harry)

output: x = Jack