Prolog Programming Assignment

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)

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)
output 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 parameter in our query

The query will produce output of every jealous (x,y) pair on our Prolog code. The jealous() rule follows
;ealous (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

2) How does the queries in list.pl file are executed

→ code:
```
suffix (xs, ys):-
    append (_, ys, xs).

Prefix (xs, ys) :-
    append (ys, _, xs)

sublist (xs, ys):-
    suffix (xs, zs),
    Prefix (zs, ys)

mrev ([], [])
mrev ([H|T0], L):-
    mrev (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 between the first

element 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.

Query:- ? suffix ([a,b,c], zs)

output : zs = [a,b,c]
zs = [b,c]
zs = [c]
zs = [ ]
false.

Explanation:- suffix is general eliminates the front elements from a list
Here by using suffix procedure
[a,b,c] elements are removed
from a and continous until
all the elements are removed. As
there are no more elements into
list the output will be displayed
as false.

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

→

Code : factorial (0,1)
factorial (N,F) :-

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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 string and results of query execution for any of 5 task :

a) In which year was the movie american Beauty released

query : movie (american Beauty, y)

output : y = 1999

b) find the movie 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 movie released before 200

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 : ∃ movie (M, Y) Y > 1990

output : M = american-beauty
Y = 1999

M = barton-fink
Y = 1991

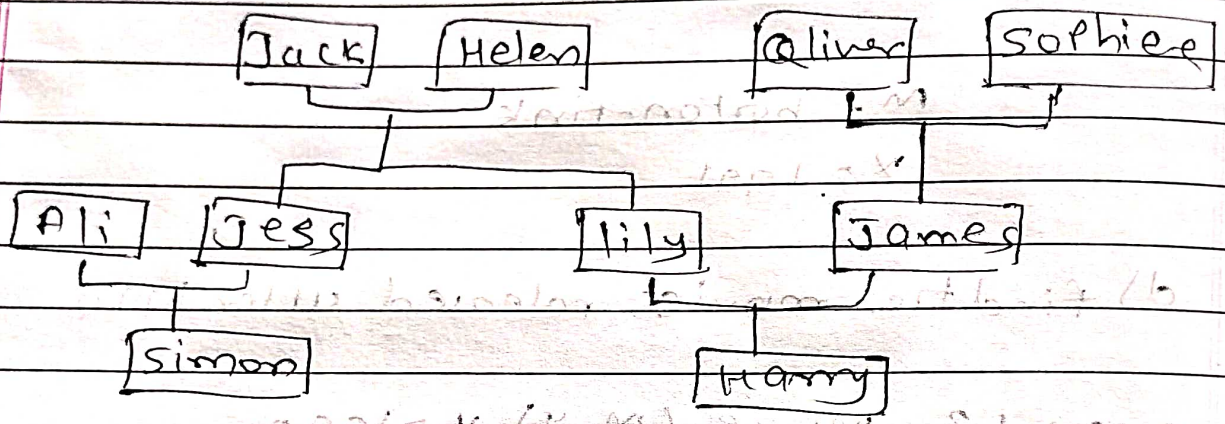
e) find a director of a movie in which scarlett Johanssin appeared.

query - ∃ actress (M, scarlett-Jonhansson)
director (M, D)

output : D = peter-webber
M = girl-with-a-pearl-earring

Q5 Draw a family tree of you (an arbitrary 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 at least 6 queries and query results on your KB

→ Diagram



family tree

query1: ? mother of (x, jess)

output: x = helen

Query 2 : ? Parent of (x, simon)

output: x = jess

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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.