ASSIGNMENT - 3

PROLOG

Answer the following questions and submit the pdf file of answers.

Naming Convention: RollNo_AS3

Submission Link: http://172.16.117.149/CS331_uploader/

Deadline: 10th February, 2023 till 12 Noon

Evaluation for the above assignment will be conveyed soon.

QUESTION 1:

Cut Example: Prolog program to insert an element into a list, if it is not present in the list before. And if the list has the element before we will simply cut it. For the membership checking also, if the item is at the head part, we should not check further, so cut it, otherwise check into the tail part.

```
list_member(X,[X|_]) :- !.
list_member(X,[_|TAIL]) :- list_member(X,TAIL).

list_append(A,T,T) :- list_member(A,T),!.
list_append(A,T,[A|T]).
```

Query-1: ?- list_append(a,[a,b,c,d,e], L).

Query-2: ?- list_append(k,[a,b,c,d,e], L).

For tracing of the code, please refer:
https://www.tutorialspoint.com/prolog/prolog_examples_of_cuts.htm

Note: This is one of the traces that are possible. Other ways are also possible.

QUESTION 2:

Here are some simple clauses. Consider these as the knowledge base.

Query-1: likes(mary,food).
Query-2: likes(mary,wine).
Query-3: likes(john,wine).
Query-4:likes(john,mary).

What do the following queries yield?
Explain with English translations of each line/query.

QUESTION 3:

Backtracking Example

```
eats(lion,goat).
eats(lion,deer).
eats(tiger,lamb).
eats(tiger,deer).
common(X,Y,Z):-eats(X,Z),eats(Y,Z).
```

Write a Query to find out what is the common food which both lions and tigers eat?

QUESTION 4:

Basic prolog queries

```
male(homer).
male(bart).
male(abe).
male(luke).

female(marge).
female(lisa).
female(maggie).
female(mona).
female(jane).

parent(homer, bart).
parent(homer, lisa).
parent(homer, maggie).
parent(marge, bart).
parent(marge, lisa).
parent(marge, maggie).
parent(abe, homer).
parent(mona, homer).
parent(luke, mona).
```

parent(jane, abe).

mother(X, Y) :- parent(X, Y), female(X).

father(X, Y) :- parent(X, Y), male(X).

son(X, Y) :- parent(Y, X), male(X).

daughter(X, Y) :- parent(Y, X), female(X).

grandparent(X, Y) :- parent(X, Z), parent(Z, Y).

Find out answers to the following queries:

Query-1: mother(X,maggie).

Query-2: son(X,mona).

Query-3: grandparent(luke,Y).

Query-4: grandparent(jane, Y).