CS331: Programming Languages Lab

Assignment 3 Prolog

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Question 1:

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

Result: L = [a,b,c,d,e].

```
[trace]  ?- list_append(a,[a,b,c,d,e],L).
   Call: (10) list_append(a, [a, b, c, d, e], _3164) ? creep
   Call: (11) list_member(a, [a, b, c, d, e]) ? creep
   Exit: (11) list_member(a, [a, b, c, d, e]) ? creep
   Exit: (10) list_append(a, [a, b, c, d, e], [a, b, c, d, e]) ? creep
L = [a, b, c, d, e].
```

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

Result: L = [k,a,b,c,d,e].

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[trace]  ?- list_append(k,[a,b,c,d,e],L).
   Call: (10) list_append(k, [a, b, c, d, e], _17384) ? creep
   Call: (11) list_member(k, [a, b, c, d, e]) ? creep
   Call: (12) list_member(k, [b, c, d, e]) ? creep
   Call: (13) list_member(k, [c, d, e]) ? creep
   Call: (14) list_member(k, [d, e]) ? creep
   Call: (15) list_member(k, [e]) ? creep
   Call: (16) list_member(k, []) ? creep
   Fail: (16) list_member(k, []) ? creep
   Fail: (15) list_member(k, [e]) ? creep
   Fail: (14) list_member(k, [d, e]) ? creep
   Fail: (13) list_member(k, [c, d, e]) ? creep
   Fail: (12) list_member(k, [b, c, d, e]) ? creep
   Fail: (11) list_member(k, [a, b, c, d, e]) ? creep
   Redo: (10) list_append(k, [a, b, c, d, e], _17384) ? creep
   Exit: (10) list_append(k, [a, b, c, d, e], [k, a, b, c, d, e]) ? creep
L = [k, a, b, c, d, e].
```

Question 2:

Query 1: likes(mary,food).

Ans: true.

The Query asks if mary and food are related by the relation likes. As it is given as a clause in knowledge base, it is considered to be true.

Query 2: likes(john,wine).

Ans: true.

The Query asks if john and wine are related by the relation likes. As it is given as a clause in knowledge base, it is considered to be true.

Query 3: likes(john,food).

Ans: false.

The Query asks if john and food are related by the relation likes. But since it is neither given as a clause in knowledge base nor any rule exists to determine the truthfulness of this, it is considered to be false.

Question 3:

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

Query: common(lion,tiger,X).

Result: X = deer.

Question 4:

Query 1: mother(X,maggie).

Ans: X = marge.

Query 2: son(X,mona).

Ans: X = homer.

Query 3: grandparent(luke,Y).

Ans: Y = homer.

Query 4: grandparent(jane,Y).

Ans: Y = homer.