Weekly Assignment Report

- **Question 1:**

```prolog
1   lives(british, red_house).
2   lives(X, yellow_house) :- profession(X, diplomat).
3   lives(Norwegian, X) :- right(Y, X), right(Z, Y).
4   lives(X, Y) :- near(Y, Z), lives(A, Z), owns(A, fox).
5   owns(spanish, dog).
6   owns(sculptor, snails).
7   drinks(X, coffee) :- lives(X, green_house).
8   drinks(ukrainian, tea).
9   drinks(X, milk) :- right(Z, X), right(X, Y).
10  drinks(X, orange_juice) :- profession(X, violinist).
11  right(green_house, white_house).
12  profession(japanese, acrobat).
13  horse(X) :- lives(Y, X), profession(Y, diplomat), near(X, Z), lives(A, Z), owns(A, horse).
14  near(X, blue_house) :- lives(norwegian, X).
```

Output:

```
?- drinks(X, water).
false.

?- owns(X, zebra).
false.
```

- **Question 2:**

```prolog
1   happy(X) :- parent(X, _).
2   hastwochildren(X) :- parent(X, Y), sister(_, Y).
3   grandchild(X, Y) :- parent(Y, Z), parent(Z, X).
4   aunt(X, Y) :- sister(X, Z), parent(Z, Y).
```

- **Question 3:**

```prolog
1   female(mary).
2   female(sandra).
3   female(juliet).
4   female(lisa).
5   male(peter).
6   male(paul).
7   male(john).
8   male(bob).
9   male(harry).
10  parent(bob, lisa).
11  parent(bob, paul).
12  parent(bob,mary).
13  parent(juliet, lisa).
14  parent(juliet, paul).
15  parent(juliet, mary).
16  parent(peter, harry).
17  parent(lisa, harry).
18  parent(mary, john).
19  parent(mary, sandra).
20  father(X,Y):- parent(X,Y), male(X).
21  sister(X,Y):- female(X), parent(Z, X), parent(Z, Y), X \= Y.
22  grandmother(X, Y):- female(X), parent(X, Z), parent(Z,Y).
23  grandparent(X, Y):- parent(X, Z), parent(Z, Y).
24  cousin(X,Y):- grandparent(Z,X),grandparent(Z,Y).
```

Output:

```
?- father(bob, lisa).
true .

?- father(juliet, lisa).
false.

?- sister(mary, lisa).
true .

?- sister(paul, lisa).
false.
```

```
?- grandmother(juliet, sandra).
true.

?- grandmother(juliet, bob).
false.

?- cousin(harry, sandra).
true .

?- cousin(harry, lisa).
false.
```
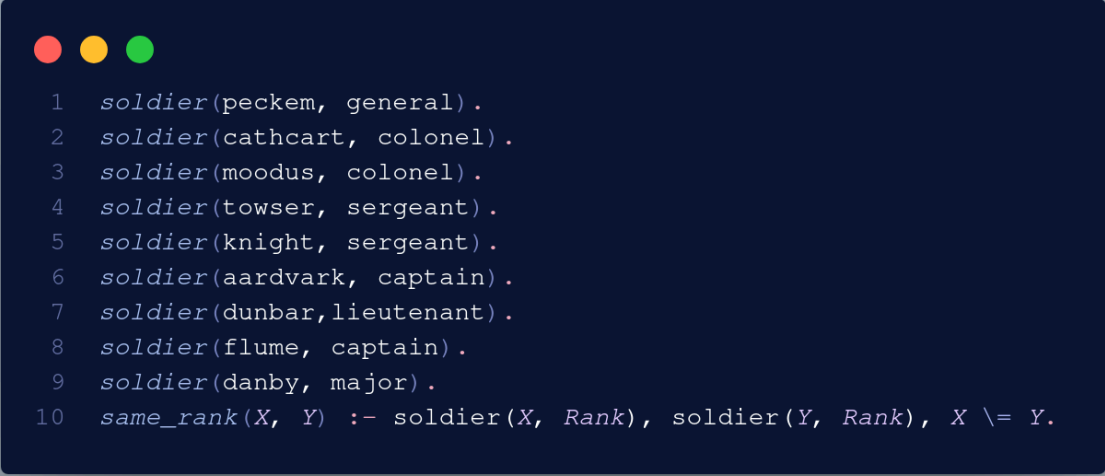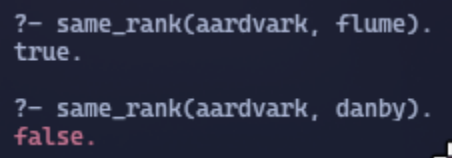
- **Question 4:**

```prolog
soldier(peckem, general).
soldier(cathcart, colonel).
soldier(moodus, colonel).
soldier(towser, sergeant).
soldier(knight, sergeant).
soldier(aardvark, captain).
soldier(dunbar,lieutenant).
soldier(flume, captain).
soldier(danby, major).
same_rank(X, Y) :- soldier(X, Rank), soldier(Y, Rank), X \= Y.
```
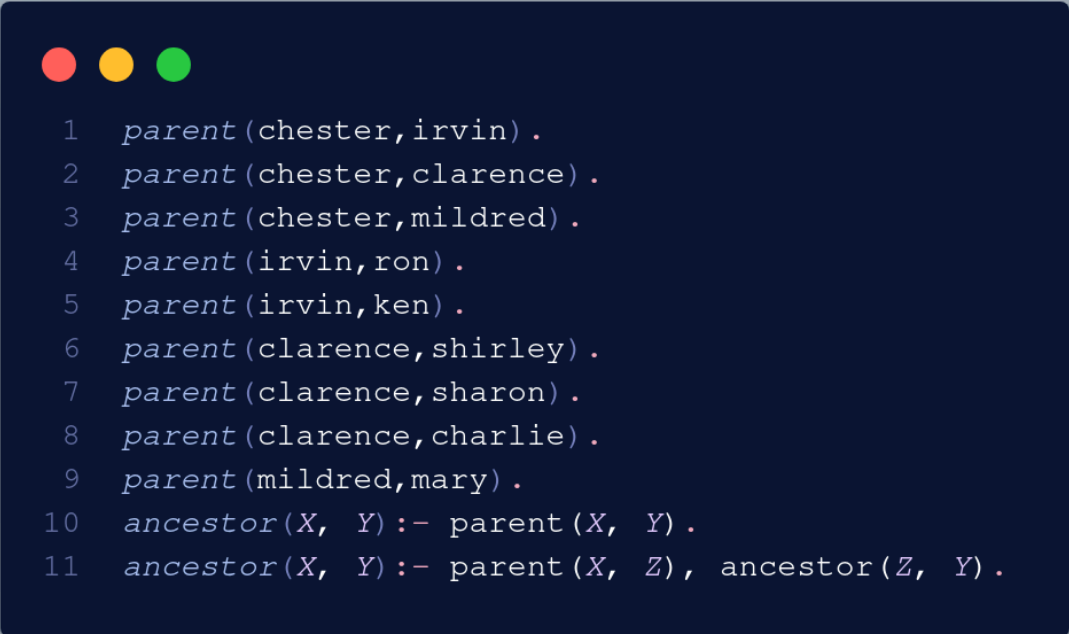
Output:

```
?- same_rank(aardvark, flume).
true.

?- same_rank(aardvark, danby).
false.
```

- **Question 5:**

```prolog
1   parent(chester,irvin).
2   parent(chester,clarence).
3   parent(chester,mildred).
4   parent(irvin,ron).
5   parent(irvin,ken).
6   parent(clarence,shirley).
7   parent(clarence,sharon).
8   parent(clarence,charlie).
9   parent(mildred,mary).
10  ancestor(X, Y):- parent(X, Y).
11  ancestor(X, Y):- parent(X, Z), ancestor(Z, Y).
```

Output:

```
?- ancestor(chester, sharon).
true .

?- ancestor(irvin, sharon).
false.
```