Principles of Programming Language

Assignment 1

Student Details

Name: Krunal Rank
Adm No: U18CO081

Question 1

```
?- write('Hello World').
Hello World
true.
```

```
?- write('Hello World'),nl,write('This is a new line').
Hello World
This is a new line
true.
```

```
?- read(X),write(X).
|: krunal.
krunal
X = krunal.
```

```
 ?- aggregate all(count,male(X),P).
 P = 5.
```

Question 2

A

f	Yes
loves(john,mary)	No
Mary	No
_c1	No
‘Hello’	Yes
this_is_it	Yes

B

a	No
A	Yes
Paul	Yes
'Hello'	No
a_123	No

_	Yes
_abc	Yes
x2	No

C

f(a, b) = f(X, Y).

X = a,
Y = b.

D

loves(mary, john) = loves(John, Mary).

Yes, because John will have “mary” assigned equal to it and Mary will have “ john” (John and Mary are variables).

```
?- loves(mary, john) = loves(John, Mary).
John = mary,
Mary = john.
```

E

```
?- a(X,X).
true.

?- a(1,X).
X = 1.

?- a(X,Y).
X = Y.

?- a(Y,Z).
Y = Z.

?- a(Z,100).
Z = 100.
```

Question 3

A

myFunctor(1, 2) = X, X = myFunctor(Y, Y).
It will return false because Y cannot be mapped to either 1 or 2.

```
?- myFunctor(1, 2) = X, X = myFunctor(Y,Y).
false.
```

B

f(a, _, c, d) = f(a, X, Y, _).
It will return Y = c since Y is being mapped to c. However, X = _ and hence, isn't mapped.

```
?- f(a,  , c, d) = f(a, X, Y,  ).
Y = c.
```

C

write('One '), X = write('Two ').
It will write One and declare X as write('Two').

```
?- write('One'),X = write('Two').
One
X = write('Two').
```

Question 4

```
female(mary).
female(sandra).
female(juliet).
female(lisa).

male(peter).
male(paul).
male(dick).
male(bob).
male(harry).

parent(bob, lisa).
parent(bob, paul).
parent(bob, mary).
parent(juliet, lisa).
parent(juliet, paul).
parent(juliet, mary).
parent(peter, harry).
parent(lisa, harry).
parent(mary, dick).
parent(mary, sandra).

father(X,Y) :- male(X),parent(X,Y).
sister(X,Y) :- parent(Z,X),parent(Z,Y),X \= Y,female(X).
grandmother(X,Y) :- parent(X,Z),parent(Z,Y),female(X).
cousin(X,Y) :- parent(A,B),parent(B,X),parent(A,D),parent(D,Y),B\=D.
```