Assignment-1

1. Write a program in prolog to print Hello World.

code.pl

```
hello:- write("Hello, World!").
```

```
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?- hello.
Hello, World!
true.
```

---

2. Write a program in prolog to create a database to store 5 persons and their phone numbers and perform the following queries:

- **a. Find the phone number of Suresh.**
- **b. Search for the person's name who has the phone number** 8765432109**.**
- **c. Check Ramesh has a phone number** 9234567801**.**
- **d. Display all people's name and their phone numbers.**

code.pl

```
phoneno(ram, 9142347561).
phoneno(shyam, 9408257155).
phoneno(suresh, 8081740495).
phoneno(mukesh, 8765432109).
phoneno(ramesh, 9234567801).
```

```
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?- phoneno('suresh', X).
X = 8081740495.

?- phoneno(Name, 8765432109).
Name = mukesh.

?- phoneno('ramesh', 9234567801).
true.

?- phoneno(Name, Number).
Name = ram,
Number = 9142347561 ;
Name = shyam,
Number = 9408257155 ;
Name = suresh,
Number = 8081740495 ;
Name = mukesh,
Number = 8765432109 ;
Name = ramesh,
Number = 9234567801.
```

---

3. Write a program in prolog to input two numbers from the user and display them.

code.pl

```
input :-
    write('Enter first number: '),
    read(X),
    write('Enter second number: '),
    read(Y),
    nl,
    write('You entered:'), nl,
    write('First number: '), write(X), nl,
    write('Second number: '), write(Y), nl.
```

```
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?- input.
Enter first number: 182.
Enter second number: |: 175.

You entered:
First number: 182
Second number: 175
true.
```

---

4. Write a program in prolog to show the following arithmetic operation between two numbers:

- **a. Addition**
- **b. Subtraction**
- **c. Multiplication**
- **d. Division**

code.pl

```
arithmetic_operations(X, Y) :-
    Sum is X + Y,
    Difference is X - Y,
    Product is X * Y,
    (Y =\= 0 -> Quotient is X / Y ; Quotient = 'undefined (division by zero)'),
    write('Addition: '), write(Sum), nl,
    write('Subtraction: '), write(Difference), nl,
    write('Multiplication: '), write(Product), nl,
    write('Division: '), write(Quotient), nl.
```

```
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?- arithmetic_operations(10, 5).
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2
true.
```

---

5. Write a program in prolog to input two numbers from user and perform following operation:

a. Modulus

b. Power

code.pl

```
operation :-
    write('Enter first number: '),
    read(X),
    write('Enter second number: '),
    read(Y),
    Modulus is X mod Y,
    Power is X ** Y,
    nl,
    write('Results:'), nl,
    write('Modulus (X mod Y): '), write(Modulus), nl,
    write('Power (X^Y): '), write(Power), nl.
```

```
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?- operation.
Enter first number: 15.
Enter second number: |: 2.

Results:
Modulus (X mod Y): 1
Power (X^Y): 225
true.
```

---

6. Write a program in prolog to check if two numbers are equal or not.

code.pl

```
equal(X, Y) :-
    X =:= Y,
    write('The numbers are equal.').

equal(X, Y) :-
    X =\= Y,
    write('The numbers are not equal.').
```

```
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?- equal(7, 4).
The numbers are not equal.
true.

?- equal(7, 7).
The numbers are equal.
true .
```

7. Write a program in prolog to find a greater and smaller number of two numbers.

code.pl

```
compare_numbers(X, Y) :-
    (X > Y ->
        write('Greater number: '), write(X), nl,
        write('Smaller number: '), write(Y)
    ;
    X < Y ->
        write('Greater number: '), write(Y), nl,
        write('Smaller number: '), write(X)
    ;
        write('Both numbers are equal.')
    ).
```

```
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?- compare_numbers(10, 5).
Greater number: 10
Smaller number: 5
true.

?- compare_numbers(4, 9).
Greater number: 9
Smaller number: 4
true.

?- compare_numbers(7, 7).
Both numbers are equal.
true.
```

8. Write a program in prolog to find Maximum and Minimum among three numbers.

code.pl

```
max_min(X, Y, Z) :-
    (X >= Y, X >= Z -> Max = X ;
     Y >= X, Y >= Z -> Max = Y ;
     Max = Z),
    (X =< Y, X =< Z -> Min = X ;
     Y =< X, Y =< Z -> Min = Y ;
     Min = Z),
    write('Maximum number: '), write(Max), nl,
    write('Minimum number: '), write(Min), nl.
```

```
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?- max_min(10, 5, 8).
Maximum number: 10
Minimum number: 5
true.

?- max_min(3, 7, 1).
Maximum number: 7
Minimum number: 1
true.

?- max_min(4, 4, 4).
Maximum number: 4
Minimum number: 4
true.
```