Assignment No:1

AIM: Design a class 'Complex 'with data members for real and imaginary part. Provide default and Parameterized constructors. Write a program to perform arithmetic operations of two complex numbers.

```
import java.util.Scanner;

public class Complex

{

public static void main(String args[])

        {

                int num1, num2, answer,ch=0;

                Complex_Op cal = new Complex_Op () ;

                Scanner sc = new Scanner(System.in);

                System.out.print("Enter first Number :\n");

                num1 = sc.nextInt(); //Real part

                num2 = sc.nextInt(); //Imaginary Part

                Complex_Op Object1 = new Complex_Op(num1,num2);

                System.out.print("Enter Second Number :\n");

                num1 = sc.nextInt(); //Real Part

                num2 = sc.nextInt(); //Imaginary Part

                Complex_Op Object2 = new Complex_Op(num1,num2);

                System.out.println ("******Following Arithmetic Operations are perform
                on Complex Numbers*****");

                System.out.println("1. Addition");

                System.out.println("2. Substraction");

                System.out.println("3. Multiplication");

                System.out.println("4. Division");

                System.out.println("Enter Your Choice : ");

                ch=sc.nextInt();

                switch(ch)

                {
```

```
                case 1: cal.Addition(Object1,Object2);
                        break;
                case 2: cal.Substraction(Object1,Object2);
                        break;
                case 3: cal.Multiplication(Object1,Object2);
                        break;
                case 4: cal.Division(Object1,Object2);
                        break;
            }
        }
}
 class Complex_Op
          {
              float real,imag;
           Complex_Op() //Default Constructor
                {
                   real=0;
                    imag=0;
                 }
           Complex_Op(float Comp1,float Comp2) //Parameterized Constructor
                   {
                      real=Comp1;
                       imag=Comp2;
                   }
                   void Addition(Complex_Op C1,Complex_Op C2)
                   {
                        float real,imag;
                        real = (C1.real + C2.real);
                       imag = (C1.imag + C2.imag);
```

```
 System.out.println("Addition is:("+real+") + ("+imag+")i" );
}
void Substraction(Complex_Op C1,Complex_Op C2)
{
    float real,imag;
    real = (C1.real -C2.real);
    imag = (C1.imag - C2.imag);
    System.out.println("Substraction is:("+real+") - ("+imag+")i");
}
void Multiplication(Complex_Op C1,Complex_Op C2)
{
     float real,imag;
     real=(C1.real * C2.real - C1.imag * C2.imag);
      imag=(C1.real * C2.imag+ C1.imag * C2.real);
       System.out.println("Multiplication is:("+real+") *("+imag+")i");
}
void Division(Complex_Op C1,Complex_Op C2)
{
      float real,imag;
      float a = C1.real;
      float b = C1.imag;
      float c= C2.real;
      float d = C2.imag;
      float denominator = c * c + d * d;
      real = (a * c + b * d) / denominator;
       imag= (b * c - a * d) / denominator;
       System.out.println("Division is:("+real+") / ("+imag+")i" );
}
}
```

Output

Enter first Number

2 3

Enter Second Number

3 4

********Following Arithmetic Operations are perform on**

Complex Numbers*****

1.Addition

2.Substraction

3.Multiplication

4.Division

Enter Your Choice :

1

Addition is:(5.0) + (7.0)i