Assignment No. 01

Name:
Roll.No.:

/* 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. */

Source Code :

```
import java.util.*;
class Complex_No{
   float real,img;//data  member
   public Complex_No(){
      //default constructor
      real=0;
      img=0;
   }
   public Complex_No(float a ,float b){
      //parameterized constructor
      real=a;
      img=b;
   }

   public void Display(Complex_No C1,Complex_No C2) {
      System.out.println("First Complex Numbers =("+C1.real+")+("+C1.img+")i");
      //printing first complex number
      System.out.println("Second Complex Numbers =("+C2.real+")+("+C2.img+")i");
      //printing second complex number
   }

   public void AddNumbers(Complex_No C1,Complex_No C2) {
      //addition of two complex number
      float real,img;
      real=(C1.real+C2.real);
      //real part of complex number
      img=(C1.img+C2.img);
      //img part of complex number
      System.out.println("Addition of Complex Numbers =("+real+")+("+img+")i");
      //printing addition of two complex number
   }

   public void SubNumbers(Complex_No C1,Complex_No C2) {
      //substraction of two complex number
      float real,img;
      real=(C1.real-C2.real);
      //real part of complex number
      img=(C1.img-C2.img);
      //img part of complex number
      System.out.println("Substraction of Complex Numbers =("+real+")+("+img+")i");
      //priting substraction of two complex number
   }

   public void MultiNumbers(Complex_No C1,Complex_No C2) {
      //multiplication of two complex number
      float real,img;
      real=(C1.real*C2.real-C1.img*C2.img);
      //real part of complex number
      img=(C1.real*C2.img+C1.img*C2.real);
```

```
        //img part of complex number
        System.out.println("Multiplication of Complex Numbers =("+real+")+("+img+")i");
        //printing multiplication of two complex number
    }

    public void DivNumbers(Complex_No C1,Complex_No C2) {
        //division of two complex number
        float real,img;
        real=(C1.real*C2.real+C1.img*C2.img)/(C2.real*C2.real+C2.img*C2.img);
        //real part of complex number
        img=(C1.img*C2.real-C1.real*C2.img)/(C2.real*C2.real+C2.img*C2.img);
        //img part of complex number
        System.out.println("Division of Complex Numbers =("+real+")+("+img+")i");
        //printing division of two complex number
    }

}

//======================== CLASS Main ========================//
public class Main {

    public static void main(String[] args) {
        float num1,num2;
        Complex_No cal=new Complex_No();
        Scanner Sc=new Scanner(System.in);
        System.out.println("Enter the Complex number in a+bi format : ");

        //taking input for First Number
        System.out.print("Enter real part of First Number: a : ");
        num1=Sc.nextFloat();
        System.out.print("Enter img part of First Number: b : ");
        num2=Sc.nextFloat();
        Complex_No Com1=new Complex_No(num1,num2);

        //taking input for Second Number
        System.out.print("Enter real part of Second Number: a : ");
        num1=Sc.nextFloat();
        System.out.print("Enter img part of Second Number: b : ");
        num2=Sc.nextFloat();
        Complex_No Com2=new Complex_No(num1,num2);
        Sc.close();//clsing scanner close

        System.out.print("\n");
        cal.Display(Com1,Com2);
        //calling display function
        System.out.print("\n");
        cal.AddNumbers(Com1,Com2);
        //calling addition function
        cal.SubNumbers(Com1,Com2);
        //calling substraction function
        cal.MultiNumbers(Com1,Com2);
        //calling multiplication function
        cal.DivNumbers(Com1, Com2);
        //calling division function

    }

}
```

Output :

```
Enter the Complex number in a+bi format :
Enter real part of First Number: a : 2
Enter img part of First Number: b : 3

Enter real part of Second Number: a : 4
Enter img part of Second Number: b : 5

First Complex Numbers =(2.0)+(3.0)i
Second Complex Numbers =(4.0)+(5.0)i

Addition of Complex Numbers =(6.0)+(8.0)I

Substraction of Complex Numbers =(-2.0)+(-2.0)I

Multiplication of Complex Numbers =(-7.0)+(22.0)I

Division of Complex Numbers =(0.5609756)+(0.048780486)i

Process finished with exit code 0
```