LAB 5

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S No.	Title	Date Of Implementation	Remarks
1	Program that randomly generates complex numbers and write two numbers per line along with an operator(+,-,*,/) .The numbers are written in the format (a+ib)	07-02-2021	

Program that randomly generates complex numbers and write two numbers per line along with an operator(+,-,*,/) .The numbers are written in the format (a+ib)

OBJECTIVE:

The following program sets real and imaginary parts of 2 complex numbers randomly using the Random library and hence creates a random Complex number. It then performs addition, subtraction, multiplication and division operations on the numbers and prints the result.

CODE:

```
import java.util.Random;

public class Lab5 {
    public class Complex{
        double re, im;
        Random rand = new Random();

        Complex(){
            this.re = rand.nextDouble(99);
            this.im = rand.nextDouble(99);
        }

        void printComplex(){
            System.out.printf("%.2f + i%.2f", this.re, this.im);
        }

        void add(Complex c1){
            Complex c = new Complex();
            c.re = this.re+c1.re;
            c.im = this.im+c1.im;

            System.out.print("(");
            this.printComplex();
            System.out.print(") + (");
            c1.printComplex();
            System.out.print(") = ");
            c.printComplex();
        }

        void sub(Complex c1){
            Complex c = new Complex();
            c.re = this.re-c1.re;
            c.im = this.im-c1.im;

            System.out.print("(");
            this.printComplex();
            System.out.print(") - (");
            c1.printComplex();
            System.out.print(") = ");
            c.printComplex();
```

```
        }

        void multiply(Complex c1){
            Complex c = new Complex();
            c.re = this.re*c1.re - this.im*c1.im;
            c.im = this.re*c1.im - this.im*c1.re;

            System.out.print("(");
            this.printComplex();
            System.out.print(") * (");
            c1.printComplex();
            System.out.print(") = ");
            c.printComplex();
        }

        void divide(Complex c1){
            Complex c = new Complex();
            c.re = (this.re*c1.re - this.im*c1.im)/(c1.re*c1.re+c1.im*c1.im);
            c.im = (this.re*c1.im - this.im*c1.re)/(c1.re*c1.re+c1.im*c1.im);

            System.out.print("(");
            this.printComplex();
            System.out.print(") / (");
            c1.printComplex();
            System.out.print(") = ");
            c.printComplex();
        }
    }

    public static void main(String args[]){
        Lab5 l = new Lab5();

        Complex c1 = l.new Complex();
        Complex c2 = l.new Complex();

        System.out.print("c1 = ");
        c1.printComplex();
        System.out.println("");
        System.out.print("c2 = ");
        c2.printComplex();
        System.out.println("");

        c1.add(c2);
        System.out.println("");
        c1.sub(c2);
        System.out.println("");
        c1.multiply(c2);
        System.out.println("");
        c1.divide(c2);
    }
}
```

OUTPUT:

```
PS C:\Users\beadi\Desktop\JAVA LAB\Practical 5> cd "c:\Users
c1 = 2.68 + i24.89
c2 = 89.30 + i17.82
(2.68 + i24.89) + (89.30 + i17.82) = 91.98 + i42.70
(2.68 + i24.89) - (89.30 + i17.82) = -86.62 + i7.07
(2.68 + i24.89) * (89.30 + i17.82) = -203.68 + i-2174.48
(2.68 + i24.89) / (89.30 + i17.82) = -0.02 + i-0.26
```