LAB 4

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| S No. | Title | Date Of Implementation | Remarks |
| 1 | Program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double. | 31-01-2021 |  |

Program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double.

OBJECTIVE:

The following program inputs real and imaginary parts of a complex number from the user, stores them in a class object and outputs them. It also performs addition and subtraction operations.

I created a class Complex that stores the real and imaginary parts in double data type. I have also created constructors that convert the data type from int or string to store it in the Complex object (as a double)

CODE:

import java.util.Scanner;

public class Lab4 {

    public class Complex{

        double r, im;

        Complex(){

            this(0,0);

        }

        Complex(int r, int im){

            this.r = (double)r;

            this.im = (double)im;

        }

        Complex(double r, double im){

            this.r = r;

            this.im = im;

        }

        Complex(String s){

            int l = s.length();

            int i;

            Boolean neg = false;

            if (s.indexOf('+') != -1) {

                i = s.indexOf('+');

            }

            else {

                neg = true;

                i = s.indexOf('-');

            }

            String real = s.substring(0, i);

            String imaginary = s.substring(i + 1, l - 1);

            this.r = Double.parseDouble(real);

            this.im = Double.parseDouble(imaginary);

            if(neg){

                this.im = -1.0\*(this.im);

            }

        }

        void printNumber(){

            if(this.im>=0){

                System.out.println(this.r+"+"+this.im+"i");

            }

            else{

                System.out.println(this.r+""+this.im+"i");

            }

        }

        void sum(Complex c2){

            Complex c = new Complex();

            c.r = this.r + c2.r;

            c.im = this.im + c2.im;

            System.out.print("Sum = ");

            c.printNumber();

        }

        void subtract(Complex c2){

            Complex c = new Complex();

            c.r = this.r - c2.r;

            c.im = this.im - c2.im;

            System.out.print("Difference = ");

            c.printNumber();

        }

    }

    public static void main(String[] args){

        Scanner sc = new Scanner(System.in);

        System.out.print("Enter integer real part: ");

        int r1 = sc.nextInt();

        System.out.print("Enter integer imaginary part: ");

        int im1 = sc.nextInt();

        Lab4 l = new Lab4();

        Complex c1 = l.new Complex(r1, im1);

        System.out.print("c1=");

        c1.printNumber();

        System.out.print("Enter double real part: ");

        double r2 = sc.nextDouble();

        System.out.print("Enter double imaginary part: ");

        double im2 = sc.nextDouble();

        Complex c2 = l.new Complex(r2, im2);

        System.out.print("c2=");

        c2.printNumber();

        System.out.print("Enter the complex number as a string: ");

        String s = sc.next();

        Complex c3 = l.new Complex(s);

        System.out.print("c3=");

        c3.printNumber();

        System.out.print("c1+c2=");

        c1.sum(c2);

        System.out.print("c1-c2=");

        c1.subtract(c2);

        sc.close();

    }

}

OUTPUT:

