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ROLL NO:15L124

DEPT:ECE-'A'

**********JAVA PROGRAMMING**********

TASK→6

PROGRAM:

//TO IMPLEMENT THE OPERATION OF THE COMPLEX NUMBERS

Complex.java

SOURCE CODE:

```
class Complex{
    private double real =1.0;
    private double imaginary =1.0;
    public Complex() {
        this(1.0,1.0);
    }
    public Complex(double real,double imaginary) {
        this.real = real;
        this.imaginary = imaginary;
    }
    public Complex(double real) {
        this.real = real;
     }
    public Complex add(Complex another) {
        double real = another.real + this.real;
        double imaginary = another.imaginary + this.imaginary;
        Complex result = new Complex(real,imaginary);
        return result;
    }
    public Complex subtract(Complex another) {
        double real = another.real - this.real;
        double imaginary = another.imaginary - this.imaginary;
        Complex result = new Complex(real,imaginary);
        return result;
    }
    public Complex multiplyWith(Complex another) {
        double real=(another.real * this.real ) - ( another.imaginary *
this.imaginary );
```

```
        double imaginary=( another.imaginary * this.real ) + ( another.real *
this.imaginary);
        Complex result = new Complex(real,imaginary);
        return result;
    }
    public Complex divideBy(Complex another) {
        double temp=( this.real * this.real ) + ( this.imaginary * this.imaginary
);
        double real=Math.round((( another.real * this.real ) + (
another.imaginary * this.imaginary ))/temp);

        double imaginary=Math.round((( - this.imaginary * another.real ) +
(this.real * another.imaginary))/temp);
        Complex result = new Complex(real,imaginary);
        return result;
    }
    public boolean isReal(){
        boolean val=( this.real != 0 && this.imaginary == 0) ? true : false;
        return val;
    }
    public boolean isImaginary(){
        boolean val=( this.real == 0 && this.imaginary != 0) ? true : false;
        return val;
    }
    public String toString(){
        return "\nCOMPLEX NUMBER:"+this.real+((this.imaginary > 0) ?
"+":"")+this.imaginary+"j\n";
    }

}
```

Solution.java:

SOURCE CODE:

```
public class Solution {
    public static void main(String[] args) {
        Complex complex=new Complex();
        Complex complex1=new Complex(2,3);
        Complex complex2=new Complex(5,2);
        System.out.println("       RESULT      ");
        System.out.println("*******ADDITION******\n"+complex1.add(complex2));

System.out.println("*******SUBTRACTION******\n"+complex1.subtract(complex2));
```

```
System.out.println("******MULTIPLICATION******\n"+complex1.multiplyWith(complex2
));

System.out.println("******DIVISION******\n"+complex1.divideBy(complex2));
        System.out.println("*******COMPLEX IS REAL******\n"+complex1.isReal());
        System.out.println("*******COMPLEX IS
IMAGINARY******\n"+complex1.isImaginary());
        ;

    }
}
```

OUTPUT:

```
C:\Users\students\Documents\complex>javac Solution.java

C:\Users\students\Documents\complex>java Solution
       RESULT
*******ADDITION******

COMPLEX NUMBER:7.0+5.0j

*******SUBTRACTION******

COMPLEX NUMBER:3.0-1.0j

*******MULTIPLICATION******

COMPLEX NUMBER:4.0+19.0j

*******DIVISION******

COMPLEX NUMBER:1.0-1.0j

*******COMPLEX IS REAL******
false
*******COMPLEX IS IMAGINARY******
false
```