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Section D Roll 62

Part 2, LAB 3 (Classes and Objects)

1) CODE:

```
import java.util.*;
class Complex{
    int real, ima;
    void setComplex(int a, int b){
        real = a;
        ima = b;
    }
    void disp(){
        System.out.println(real +"("+ ima +"i");
    }
    Complex add(Complex a){
        Complex temp = new Complex();
        temp.setComplex(a.real+real, a.ima+ima);
        return temp;
    }
    Complex sub(Complex a){
        Complex temp = new Complex();
        temp.setComplex(Math.abs(a.real-real),Math.abs(a.ima-ima));
        return temp;
    }
}
public class testcomplex{
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the real and imaginary parts of first number: ");
        int real = sc.nextInt();
        int ima = sc.nextInt();
        Complex n1 = new Complex();
        n1.setComplex(real, ima);
        n1.disp();
        System.out.println("Enter the real and imaginary parts of second number : ");
        real = sc.nextInt();
        ima = sc.nextInt();
        Complex n2 = new Complex();
        n2.setComplex(real,ima);
        n2.disp();
        System.out.println("Sum is : ");
        n1.add(n2).disp();
        System.out.println("Difference is : ");
        n1.sub(n2).disp();
        System.out.println();
    }
}
```

OUTPUT :

```
student@lplab-Lenovo-Product: ~/Desktop/AyushGoyalOOP
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ javac testcomplex.java
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ java testcomplex
Enter the real and imaginary parts of first number:
5 6
5+(6)i
Enter the real and imaginary parts of second number :
2 3
2+(3)i
Sum is :
7+(9)i
Difference is :
3+(3)i

student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ |
```

2) CODE:

```
import java.util.*;
class Time {
    int hours, minutes, seconds;
    void setTime(int hours, int minutes, int seconds) {
        this.hours = hours;
        this.minutes = minutes;
        this.seconds = seconds;}
    void disp() {
        System.out.println(hours + ":" + minutes + ":" + seconds);
    }
    Time add(Time a1) {
        Time a = new Time();
        int testSeconds = 0, testMinutes = 0, testHours = 0;
        testSeconds = a1.seconds + seconds;
        testMinutes = a1.minutes + minutes;
        testHours = a1.hours + hours;
        a.setTime(testHours, testMinutes, testSeconds);
        a.minutes += a.seconds / 60;
        a.seconds = a.seconds % 60;
        a.hours += a.minutes / 60;
        a.minutes = a.minutes % 60;
        return a;
    }
    Time subtract(Time a) {
        Time test = new Time();
        test.setTime((Math.abs(a.hours - hours)), (Math.abs(a.minutes - minutes)),
            Math.abs(a.seconds - seconds));
        return test;
    }
    public int isGreaterThan(Time a) {
        if (this.hours * 24 + this.minutes * 60 + this.seconds > a.hours * 24 + a.minutes * 60
            + a.seconds)
            return 1;
        else if (this.hours * 24 + this.minutes * 60 + this.seconds == a.hours * 24 + a.minutes
```

```

        * 60 + a.seconds)
            return 0;
        else
            return -1;
    }
}

public class lab3complex {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter first time : ");
        int h, m, s;
        h = sc.nextInt();
        m = sc.nextInt();
        s = sc.nextInt();
        Time t1 = new Time();
        t1.setTime(h, m, s);
        t1.disp();
        System.out.println("Enter second time : ");
        h = sc.nextInt();
        m = sc.nextInt();
        s = sc.nextInt();
        Time t2 = new Time();
        t2.setTime(h, m, s);
        t2.disp();
        Time add = t1.add(t2);
        Time sub = t1.subtract(t2);
        System.out.println("Added time is : ");
        add.disp();
        System.out.println("Subtracted time is : ");
        sub.disp();
        if(t1.isGreaterThan(t2)==1) {
            System.out.println("T1 is greater.");
        }
        else if(t1.isGreaterThan(t2)==0) {
            System.out.println("Equal times.");
        }
        else {
            System.out.println("T2 is greater.");
        }
    }
}

```

OUTPUT:

```
student@lplab-Lenovo-Product: ~/Desktop/AyushGoyalOOP
student@lplab-Lenovo-Product:~$ cd Desktop
student@lplab-Lenovo-Product:~/Desktop$ cd AyushGoyalOOP/
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ javac lab3complex.java
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ java lab3complex
Enter first time :
10
35
16
10:35:16
Enter second time :
11
45
7
11:45:7
Added time is :
22:20:23
Subtracted time is :
1:10:9
T2 is greater.
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ |
```

LAB 4 : Constructors and Static Members

1) CODE:

```
import java.util.Scanner;
class complex{
    int a,b;
    complex(){
        this.a = 0;
        this.b = 0;
    }
    complex(int a,int b){
        this.a = a;
        this.b = b;
    }
    public static void disp(complex c){
        if(c.b >= 0)
            System.out.println(c.a + " +i"+c.b);
        else
            System.out.println(c.a + " -i"+Math.abs(c.b));
    }

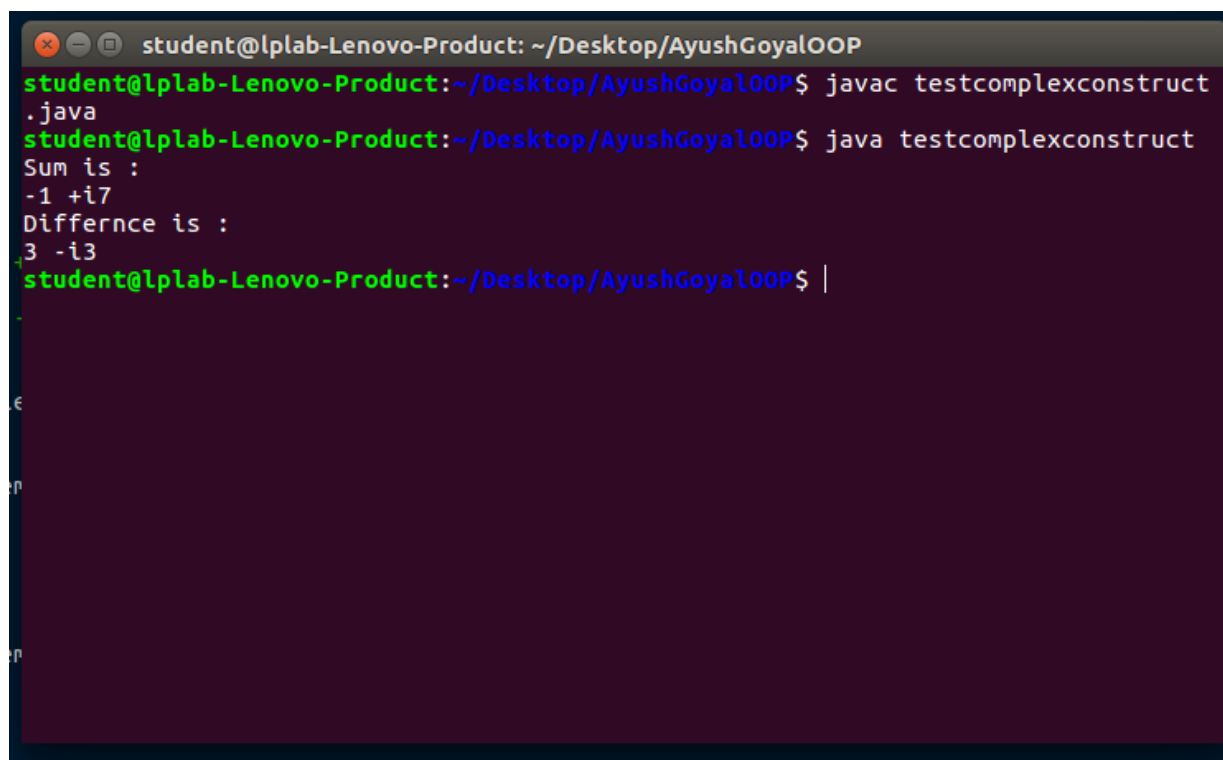
    public static complex add(complex c, complex d){
        int temp1 = c.a + d.a;
        int temp2 = c.b + d.b;
        complex res = new complex(temp1,temp2);
```

```

        return res;
    }
    static complex sub(complex c, complex d){
        int temp1 = c.a - d.a;
        int temp2 = c.b - d.b;
        complex res = new complex(temp1,temp2);
        return res;
    }
}
class testcomplexconstruct{
    public static void main(String[] args){
        complex c = new complex(1,2);
        complex d = new complex(-2,5);
        complex res = new complex();
        res = complex.add(c,d);
        System.out.println("Sum is : ");
        complex.disp(res);
        res = complex.sub(c,d);
        System.out.println("Differnce is : ");
        complex.disp(res);
    }
}

```

OUTPUT :



```

student@lplab-Lenovo-Product: ~/Desktop/AyushGoyalOOP
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ javac testcomplexconstruct
.java
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ java testcomplexconstruct
Sum is :
-1 +i7
Differnce is :
3 -i3
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ |

```

4) CODE:

```

class Counter{
    static int n = 0;
    Counter(){
        System.out.println("Object Created");
        this.n++;
    }
    static void showCount(){
        System.out.println("Number of Objects : "+ n);
    }
}
class testcounter{
    public static void main(String args[]){
        Counter a = new Counter();
        Counter b = new Counter();
        Counter.showCount();
        Counter c = new Counter();
        Counter.showCount();
    }
}

```

OUTPUT:

```

student@lplab-Lenovo-Product: ~/Desktop/AyushGoyalOOP
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ javac testcounter.java
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ java testcounter
Object Created
Object Created
Number of Objects : 2
Object Created
Number of Objects : 3
student@lplab-Lenovo-Product:~/Desktop/AyushGoyalOOP$ |

```