Object Oriented Programming
ASSIGNMENT NO 3

SUBMITTED BY:

Hasaan Ahmad SP22-BSE-017

SUBMITTED TO: Sir Muzaffar Iqbal

Activity 1:

```
package Lab3;

class Circle {
    private int radius;

    public Circle() {
        radius = 7;
    }

    public Circle(int r) {
        radius = r;
    }

    public void setRadius(int r) {
        radius = r;
    }

    public int getRadius() {
        return radius;
    }

    public void display() {
        System.out.println("radius = " + radius);
    }

    public double CalculateCircumference() {
        return 2 * 3.14 * radius;
    }

}

public class Runner {
    public static void main(String args[]) {
        Circle c1 = new Circle();
        c1.setRadius(5);
        System.out.println("Circumference of Circle 1 is: " +
c1.CalculateCircumference());
        int r = c1.getRadius();
        Circle c2 = new Circle(r);
        c2.setRadius(5);
        System.out.println("Circumference of Circle 2 is: " +
c2.CalculateCircumference());
    }
```

```
}
```

Output:

```
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  & '
es' '-cp' 'D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManu
Circumference of Circle 1 is: 31.400000000000002
Circumference of Circle 2 is: 31.400000000000002
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Activity 2:

```
package Lab3;

/**
 * Runner1
 */
public class Runner1 {

    public static void main(String[] args) {

        Rectangle1 rect = new Rectangle1();
        rect.setLength(5);
        rect.setWidth(10);
        System.out.println("Area of Rectangle is: " + rect.area());
        System.out.println("Width of Rectangle is: " + rect.getWidth());

    }
}

class Rectangle1 {
    private int length, width;

    public Rectangle1() {
        length = 5;
        width = 2;
    }

    public Rectangle1(int l, int w) {
        length = l;
        width = w;
```

```
    }

    public void setLength(int l) // sets the value of length
    {
        length = l;
    }

    public void setWidth(int w) // sets the value of width
    {
        width = w;
    }

    public int getLength() // gets the value of length
    {
        return length;
    }

    public int getWidth() // gets the value of width
    {
        return width;
    }

    public int area() {
        return (length * width);
    }
}
```

Output:

```
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  &
ExceptionMessages' '-cp' 'D:\Ishtudy Material\3rd Sem\
Area of Rectangle is: 50
Width of Rectangle is: 10
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Activity 3:

```
package Lab3;

public class Runner2 {

    public static void main(String[] args) {
        Point p1 = new Point();
```

```
        p1.setX(10);
        p1.setY(7);
        p1.display();
        Point p2 = new Point(10, 11);
        p2.movePoint(2, 3);
        p2.display();
    }
}

class Point {
    private int x;
    private int y;

    public Point() {
        x = 0;
        y = 0;
    }

    public Point(int a, int b) {
        x = a;
        y = b;
    }

    public void setX(int a) {
        x = a;
    }

    public void setY(int b) {
        y = b;
    }

    public int getX() {
        return x;
    }

    public int getY() {
        return y;
    }

    public void display() {
        System.out.println("x coordinate = " + x
                + " y coordinate = " + y);
    }

    public void movePoint(int a, int b) {
```

```
        x = x + a;
        y = y + b;
    }
}
```

Output:

```
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  & 'C
ExceptionMessages' '-cp' 'D:\Ishtudy Material\3rd Sem\OO
x coordinate = 10 y coordinate = 7
x coordinate = 12 y coordinate = 14
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Graded Lab Task 1:

```
package Lab3;

/**
 * GLT1
 */
public class GLT1 {
    public static void main(String[] args) {
        Marks m1 = new Marks(90, 30, 50);
        System.out.println(m1);
        // m1.sciMarks cannot be accessed as it is declared privately
        m1.setMathMarks(90);
        System.out.println(m1.toString());
    }

}

class Marks {
    private int sciMarks;
    private int mathMarks;
    private int engMarks;

    public Marks() {
        sciMarks = 50;
        mathMarks = 50;
        engMarks = 50;
    }

    public Marks(int sciMarks, int mathMarks, int engMarks) {
```

```
        this.sciMarks = sciMarks;
        this.mathMarks = mathMarks;
        this.engMarks = engMarks;
    }

    public int getSciMarks() {
        return sciMarks;
    }

    public int getMathMarks() {
        return mathMarks;
    }

    public int getEngMarks() {
        return engMarks;
    }

    public void setSciMarks(int sciMarks) {
        this.sciMarks = sciMarks;
    }

    public void setMathMarks(int mathMarks) {
        this.mathMarks = mathMarks;
    }

    public void setEngMarks(int engMarks) {
        this.engMarks = engMarks;
    }

    @Override
    public String toString() {
    return "Marks [sciMarks=" + sciMarks + ", mathMarks=" + mathMarks + ",
    engMarks=" + engMarks + "]";
    }

}
```

Output

```
        at java.base/java.io.PrintStream.println(Print
        at Lab3.GLT1.main(GLT1.java:9)
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  d:
les\Java\jdk-18.0.2\bin\java.exe' '-XX:+ShowCodeDetail
nual\bin' 'Lab3.GLT1'
Marks [sciMarks=90, mathMarks=30, engMarks=50]
Marks [sciMarks=90, mathMarks=90, engMarks=50]
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Graded Lab Task 2:

```java
package Lab3;

public class GLT2 {
    public static void main(String[] args) {
        Account a1 = new Account(10000);
        System.out.println(a1.toString());
        a1.withdrawBalance(500);
        System.out.println(a1.toString());
        a1.depositBalance(1000);
        System.out.println(a1.toString());
        Account a2 = new Account(a1.getBalance());
        System.out.println(a2.toString());
    }

}

class Account {
    private int balance;

    public Account(int balance) {
        this.balance = balance;
    }

    public Account() {
        balance = 0;
    }

    void withdrawBalance(int amount) {
        balance -= amount;
    }

    void depositBalance(int amount) {
        balance += amount;
    }
```

```
    void setBalance(int balance) {
        this.balance = balance;
    }

    public int getBalance() {
        return balance;
    }

    @Override
    public String toString() {
        return "Account [balance=" + balance + "]";
    }

}
```

Output

```
Try the new cross-platform PowerShell https://aka.ms/psc

PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  & 'C:
ExceptionMessages' '-cp' 'D:\Ishtudy Material\3rd Sem\OOP
Account [balance=10000]
Account [balance=9500]
Account [balance=10500]
Account [balance=10500]
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Graded Lab Task 3:

```
package Lab3;

public class GLT3 {
    public static void main(String[] args) {
        Student Hasaan = new Student("Hasaan Ahmad", new int[] { 10, 6, 7, 8,
9 });
        Hasaan.display();
        Student Mujtaba = new Student("Mujtaba", new int[] { 1, 2, 10, 10, 9
});
        Mujtaba.display();

        double avg1 = Hasaan.average();
```

```
        double avg2 = Mujtaba.average();
        if (avg1 > avg2) {
            System.out.println("Student 1 has greater average than student
2");
        } else if (avg2 > avg1) {
            System.out.println("Student 2 has greater average than student
1");
        } else {
            System.out.println("Both Students have same average");
        }

        Student hybrid = new Student(Hasaan.getName(),
Mujtaba.getResult_array());
        hybrid.display();
    }
}

class Student {
    private String name;
    private int[] Result_array;

    public Student(String name, int[] result_array) {
        this.name = name;
        Result_array = result_array;
    }

    public double average() {
        int sum = 0;
        for (int i = 0; i < Result_array.length; i++) {
            sum += Result_array[i];
        }
        double average = sum / Result_array.length;
        return average;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public int[] getResult_array() {
        return Result_array;
```

```
    }

    public void setResult_array(int[] result_array) {
        Result_array = result_array;
    }

    void display() {
        System.out.println("Name: " + name);
        System.out.println("Average: " + this.average());
    }
}
```

Output

```
Try the new cross-platform PowerShell https://aka.ms/psc

PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  & 'C:
ExceptionMessages' '-cp' 'D:\Ishtudy Material\3rd Sem\OOP
Account [balance=10000]
Account [balance=9500]
Account [balance=10500]
Account [balance=10500]
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```

Graded Lab Task 4:

```
package Lab3;

public class GLT4 {
    public static void main(String[] args) {
        HotDogStand stand1 = new HotDogStand(1, 0);
        HotDogStand stand2 = new HotDogStand(2, 0);
        HotDogStand stand3 = new HotDogStand(3, 0);

        stand1.justSold();
        stand1.justSold();
        stand1.justSold();
        stand1.justSold();
        stand1.justSold();
        stand1.justSold();
        stand2.justSold();
        stand2.justSold();
```

```
        stand2.justSold();
        stand2.justSold();
        stand2.justSold();
        stand2.justSold();
        stand2.justSold();
        stand3.justSold();
        stand3.justSold();
        stand3.justSold();
        stand3.justSold();
        stand3.justSold();
        stand3.justSold();
        stand3.justSold();

        stand1.display();
        stand2.display();
        stand3.display();
    }

}

class HotDogStand {
    private int _uid;
    private int soldToday;

    public HotDogStand(int _uid, int soldToday) {
        this._uid = _uid;
        this.soldToday = soldToday;
    }

    public int get_uid() {
        return _uid;
    }

    public void set_uid(int _uid) {
        this._uid = _uid;
    }

    public int getSoldToday() {
        return soldToday;
    }

    public void setSoldToday(int soldToday) {
        this.soldToday = soldToday;
    }
```

```
    void justSold() {
        soldToday++;
    }

    void display() {
        System.out.println("ID : " + _uid);
        System.out.println("Sold Today: " + soldToday);
    }

}
```

Output

```
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>  &
ExceptionMessages' '-cp' 'D:\Ishtudy Material\3rd Sem'
ID : 1
Sold Today: 6
ID : 2
Sold Today: 7
ID : 3
Sold Today: 7
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual>
```