4. Week 4- CLASSES AND OBJECTS

Create a Class Mobile with the attributes listed below,

private String manufacturer;
private String operating_system;
public String color;
private int cost;

Define a Parameterized constructor to initialize the above instance variables.

Define getter and setter methods for the attributes above.

for example : setter method for manufacturer is

void setManufacturer(String manufacturer){

this.manufacturer= manufacturer;

}

String getManufacturer(){

return manufacturer;}

Display the object details by overriding the toString() method.

For example:

Test	Result
1	manufacturer = Redmi operating_system = Andriod color = Blue cost = 34000

```java
class Mobile{
    private String manufacturer;
    private String operating_system;
    private String color;
    private int cost;

    Mobile(String w, String x, String y, int z){
        manufacturer=w;
        operating_system=x;
        color=y;
        cost=z;
    }

    void setManufacturer(String manufacturer){
        this.manufacturer=manufacturer;
    }
    void setOperatingSystem(String operating_system){
        this.operating_system=operating_system;
    }
    void setColor(String color){
        this.color=color;
    }
    void setCost(int cost){
        this.cost=cost;
    }

    String getManufacturer(){
        return manufacturer;
    }
    String getOperatingSystem(){
        return operating_system;
    }
    String getColor(){
        return color;
    }
    int getCost(){
        return cost;
    }

}

public class Main{
    public static void main(String[] args){
        Mobile m1=new Mobile("Redmi","Andriod","Blue",34000);
        String manufacture=m1.getManufacturer();
        String os=m1.getOperatingSystem();
        String colour=m1.getColor();
        int cost=m1.getCost();

        System.out.println("manufacturer = "+manufacture);
        System.out.println("operating_system = "+os);
        System.out.println("color = "+colour);
```

	Test	Expected	Got	
✓	1	manufacturer = Redmi operating_system = Andriod color = Blue cost = 34000	manufacturer = Redmi operating_system = Andriod color = Blue cost = 34000	✓

Passed all tests! ✓

Create a class Student with two private attributes, name and roll number. Create three objects by invoking different constructors available in the class Student.

Student()

Student(String name)

Student(String name, int rollno)

Input:

No input

Output:

No-arg constructor is invoked
1 arg constructor is invoked
2 arg constructor is invoked
Name =null , Roll no = 0
Name =Rajalakshmi , Roll no = 0
Name =Lakshmi , Roll no = 101

For example:

Test	Result
1	No-arg constructor is invoked 1 arg constructor is invoked 2 arg constructor is invoked Name =null , Roll no = 0 Name =Rajalakshmi , Roll no = 0 Name =Lakshmi , Roll no = 101

```
class Student{
    private String name;
    private int rollno;

    Student(){
        System.out.println("No-arg constructor is invoked");
    }
    Student(String name){
        System.out.println("1 arg constructor is invoked");
        this.name=name;
    }
    Student(String name, int rollno){
        System.out.println("2 arg constructor is invoked");
        this.name=name;
        this.rollno=rollno;
    }

    String getName(){
        return name;
    }
    int getRollno(){
        return rollno;
    }

}

public class Main{
    public static void main(String[] args){
        Student s1=new Student();
        Student s2=new Student("Rajalakshmi");
        Student s3=new Student("Lakshmi",101);

        System.out.println("Name ="+s1.getName()+" , Roll no = "+s1.getRollno());
        System.out.println("Name ="+s2.getName()+" , Roll no = "+s2.getRollno());
        System.out.println("Name ="+s3.getName()+" , Roll no = "+s3.getRollno());
    }
}
```

	Test	Expected	Got	
✓	1	No-arg constructor is invoked 1 arg constructor is invoked 2 arg constructor is invoked Name =null , Roll no = 0 Name =Rajalakshmi , Roll no = 0 Name =Lakshmi , Roll no = 101	No-arg constructor is invoked 1 arg constructor is invoked 2 arg constructor is invoked Name =null , Roll no = 0 Name =Rajalakshmi , Roll no = 0 Name =Lakshmi , Roll no = 101	✓

Passed all tests! ✓

Create a class called "Circle" with a radius attribute. You can access and modify this attribute using getter and setter methods. Calculate the area and circumference of the circle.

Area of Circle = πr^2

Circumference = $2\pi r$

Input:

2

Output:

Area = 12.57
Circumference = 12.57

For example:

Test	Input	Result
1	4	Area = 50.27 Circumference = 25.13

```
import java.io.*;
import java.util.Scanner;
import java.lang.Math;
class Circle
{
    private double radius;
    public Circle(double radius){
        // set the instance variable radius
        this.radius=radius;

    }
    public void setRadius(double radius){
        // set the radius
       this.radius=radius;

    }
    public double getRadius()    {
        // return the radius
        return radius;


    }
    public double calculateArea()  { // complete the below statement
       return Math.PI*radius*radius;

    }
    public double calculateCircumference()    {
        // complete the statement
       return  2*Math.PI*radius;
    }
}
class prog{
    public static void main(String[] args)  {
        int r;
        Scanner sc= new Scanner(System.in);
        r=sc.nextInt();
        Circle c= new Circle(r);
        System.out.println("Area = "+String.format("%.2f", c.calculateArea()));
        // invoke the calculatecircumference method
        System.out.println("Circumference = "+String.format("%.2f", c.calculateCircumference()));

    }
}
```

	Test	Input	Expected	Got	
✓	1	4	Area = 50.27 Circumference = 25.13	Area = 50.27 Circumference = 25.13	✓
✓	2	6	Area = 113.10 Circumference = 37.70	Area = 113.10 Circumference = 37.70	✓
✓	3	2	Area = 12.57 Circumference = 12.57	Area = 12.57 Circumference = 12.57	✓

Passed all tests! ✓