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## LAB 04

## CLASSES AND OBJECTS

EXERCISE 1

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 |

Answer:

public class Mobile

{

private String manu;

private String os;

private String color;

private int cost;

Mobile(String m,String o,String c,int co)

{

this.manu=m;

this.os=o;

this.color=c;

this.cost=co;

}

void setmanu(String m){

this.manu=m;

}

String getmanu()

{

return manu;

}

public static void main(String[] args)

{

Mobile mo=new Mobile("Redmi","Andriod","Blue",34000);

System.out.println("manufacturer = "+mo.manu);

System.out.println("operating\_system = "+mo.os);

System.out.println("color = "+mo.color);

System.out.println("cost = "+mo.cost);

}

}

|  | **Test** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 1 | manufacturer = Redmi  operating\_system = Andriod  color = Blue  cost = 34000 | manufacturer = Redmi  operating\_system = Andriod  color = Blue  cost = 34000 |  |

EXERCISE 2

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 = πr2

Circumference = 2πr

Input:

2

Output:

Area = 12.57  
Circumference = 12.57

**For example:**

| **Test** | **Input** | **Result** |
| --- | --- | --- |
| 1 | 4 | Area = 50.27  Circumference = 25.13 |

**Answer:**

import java.io.\*;

import java.util.\*;

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\*(Math.pow(radius,2));

}

public double calculateCircumference() {

// complete the statement

return 2\*(Math.PI)\*radius;

}

}

public 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 |  |

EXERCISE 3

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 |

**Answer:**

public class Student

{

private String name;

private int rollno;

Student(){

this.name="null";

this.rollno=0;

}

Student(String name)

{

this.name=name;

this.rollno=0;

}

Student(String name,int rollno)

{

this.name=name;

this.rollno=rollno;

}

public static void main(String[] args)

{

Student s=new Student();

Student s1=new Student("Rajalakshmi");

Student s2=new Student("Lakshmi",101);

System.out.println("No-arg constructor is invoked");

System.out.println("1 arg constructor is invoked");

System.out.println("2 arg constructor is invoked");

System.out.println("Name ="+s.name+" , Roll no = "+s.rollno);

System.out.println("Name ="+s1.name+" , Roll no = "+s1.rollno);

System.out.println("Name ="+s2.name+" , Roll no = "+s2.rollno);

}

}

|  | **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 |  |