

<b>Name</b>	Shubhan Singh
<b>UID no.</b>	2022300118
<b>Experiment No.</b>	3

<b>PROBLEM STATEMENT :</b>	Create a class circle with radius as data member. Create 2 constructors with 1 and 2 parameters and methods to calculate radius and circumference
<b>THEORY:</b>	<p><b>Constructors:</b></p> <p>Constructors in Java are special methods that are used to initialize objects when they are created. The primary purpose of constructors is to set the initial state of the object by assigning values to the instance variables of the object. In Java, every class has at least one constructor, and if a class does not have a constructor defined, the Java compiler automatically generates a default constructor. In addition to the default constructor, Java also supports parameterized constructors, which take arguments when the object is created. The parameterized constructor is defined with one or more parameters, and these parameters are used to initialize the instance variables of the object. Parameterized constructors are useful when creating objects with different initial states, or when the state of the object depends on external factors. Constructor overloading is another important feature of constructors in Java. Constructor overloading allows multiple constructors to be defined for a class, each with a different set of parameters. This feature is useful when different ways of initializing objects are required. For example, a class representing a bank account may have a constructor that takes an account number and another that takes an account number and an initial balance. When multiple constructors are defined for a class, each constructor must have a unique signature based on the number, order, and type of the parameters. This is known as method overloading. When an object is created, the appropriate constructor is called based on the arguments provided, and the instance variables of the object are initialized accordingly.</p>

**PROGRAM:**

```
import java.util.Scanner;

class shapes{
    float radius,length,breadth;
    float Area,perimeter;
    shapes(float r){//Overloaded constructor for circle
        radius=r;
        Area=Area(radius);
        perimeter=perimeter(radius);
    }
    shapes(float l, float b){//Overloaded constructor for rectangle
        length=l;
        breadth=b;
        Area=Area(length,breadth);
        perimeter=perimeter(length,breadth);
    }
    float Area(float r){
        return (float) (3.14*r*r);
    }//Area of circle
    float Area(float l, float b){
        return l*b;
    }//area of rectangle
    float perimeter(float r){
        return (float) (2*3.14*r);
    }//circ. of circle
    float perimeter(float l, float b){
        return 2*(l+b);
    }//perimeter of rectangle
}

public class constructors {
    public static void main(String[] args) { //Driver code
        Scanner sc= new Scanner(System.in);
        float r,l,b;
        System.out.println("Enter radius of circle and length and breadth of rectangle");
        r=sc.nextFloat();
        l=sc.nextFloat();
        b=sc.nextFloat();
        shapes circle=new shapes(r);
        shapes rectangle=new shapes(l,b);
        System.out.println("The area and circumference of the circle are:");
        System.out.printf("%f and %f\n",circle.Area,circle.perimeter);
        System.out.println("The ara and perimeter of the rectangle are:");
        System.out.printf("%f and %f\n",rectangle.Area,rectangle.perimeter);
    }
}
```

Link to the code(for better readability and copying):

[https://github.com/IAmAGoodBoy04/Java\\_PSOOP/blob/master/Week%202/src/](https://github.com/IAmAGoodBoy04/Java_PSOOP/blob/master/Week%202/src/)

[constructors.java](#)

```
Enter radius of circle and length and breadth of rectangle
```

```
5
```

```
4 5
```

```
The area and circumference of the circle are:
```

```
78.500000 and 31.400000
```

```
The ara and perimeter of the rectangle are:
```

```
20.000000 and 18.000000
```

**RESULT:**

```
Process finished with exit code 0
```