

OOP Lab Problem practice

(23 September 2024)

Name: Gaus Saraf Murady

ID: 0432410005101088

Section: 2B2

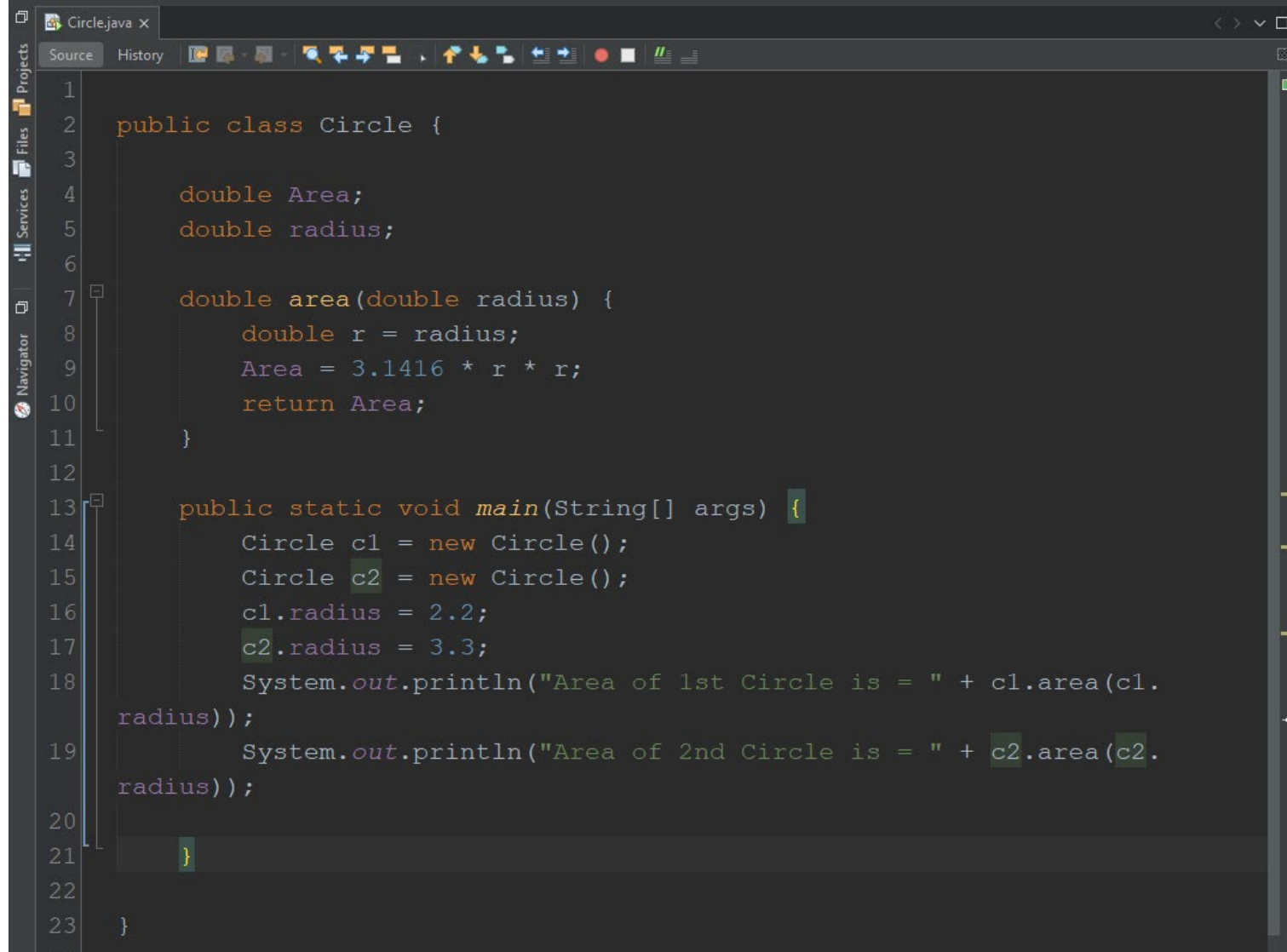
Problem 1: Create a class named Circle. It has one variable called radius and a function named area which returns the area of a circle.

Now create two different objects of Circle class, assign value of radius of each object and then calculate area of them.

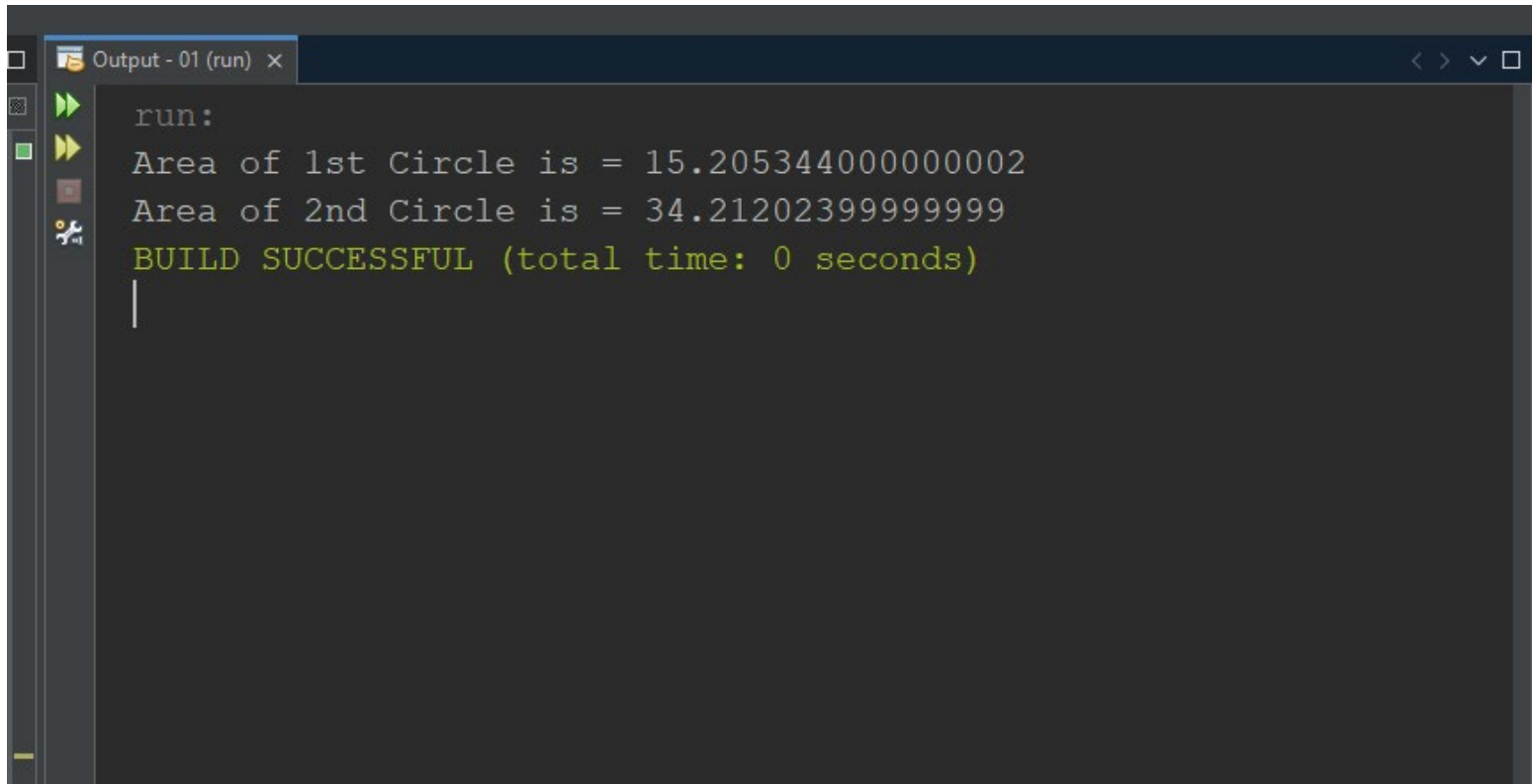
Problem 2: Implement the problem 1, where you set radius value using constructor.

Problem 3: Add a method or function of Circle class named perimeter which returns the perimeter of circle. Also, create a class containing constructor to set radius value. Now create three new objects and calculate their area and perimeter

Problem 1 Task: Create a class named Circle. It has one variable called radius and a function named area which returns the area of a circle. Now create two different objects of Circle class, assign value of radius of each object and then calculate area of them.



```
1
2 public class Circle {
3
4     double Area;
5     double radius;
6
7     double area(double radius) {
8         double r = radius;
9         Area = 3.1416 * r * r;
10        return Area;
11    }
12
13    public static void main(String[] args) {
14        Circle c1 = new Circle();
15        Circle c2 = new Circle();
16        c1.radius = 2.2;
17        c2.radius = 3.3;
18        System.out.println("Area of 1st Circle is = " + c1.area(c1.
radius));
19        System.out.println("Area of 2nd Circle is = " + c2.area(c2.
radius));
20
21    }
22
23 }
```

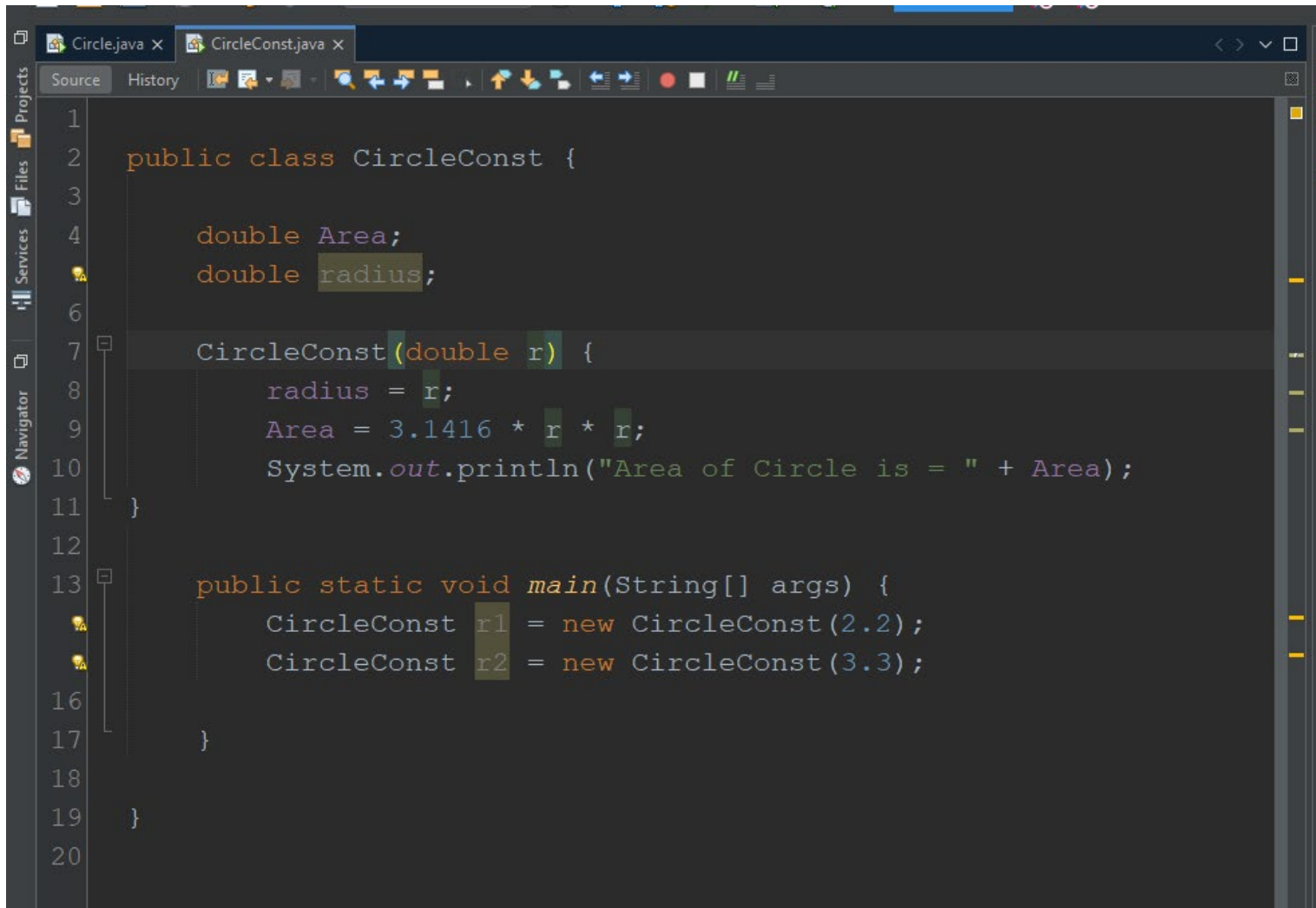


```
run:
Area of 1st Circle is = 15.205344000000002
Area of 2nd Circle is = 34.212023999999999
BUILD SUCCESSFUL (total time: 0 seconds)
|
```

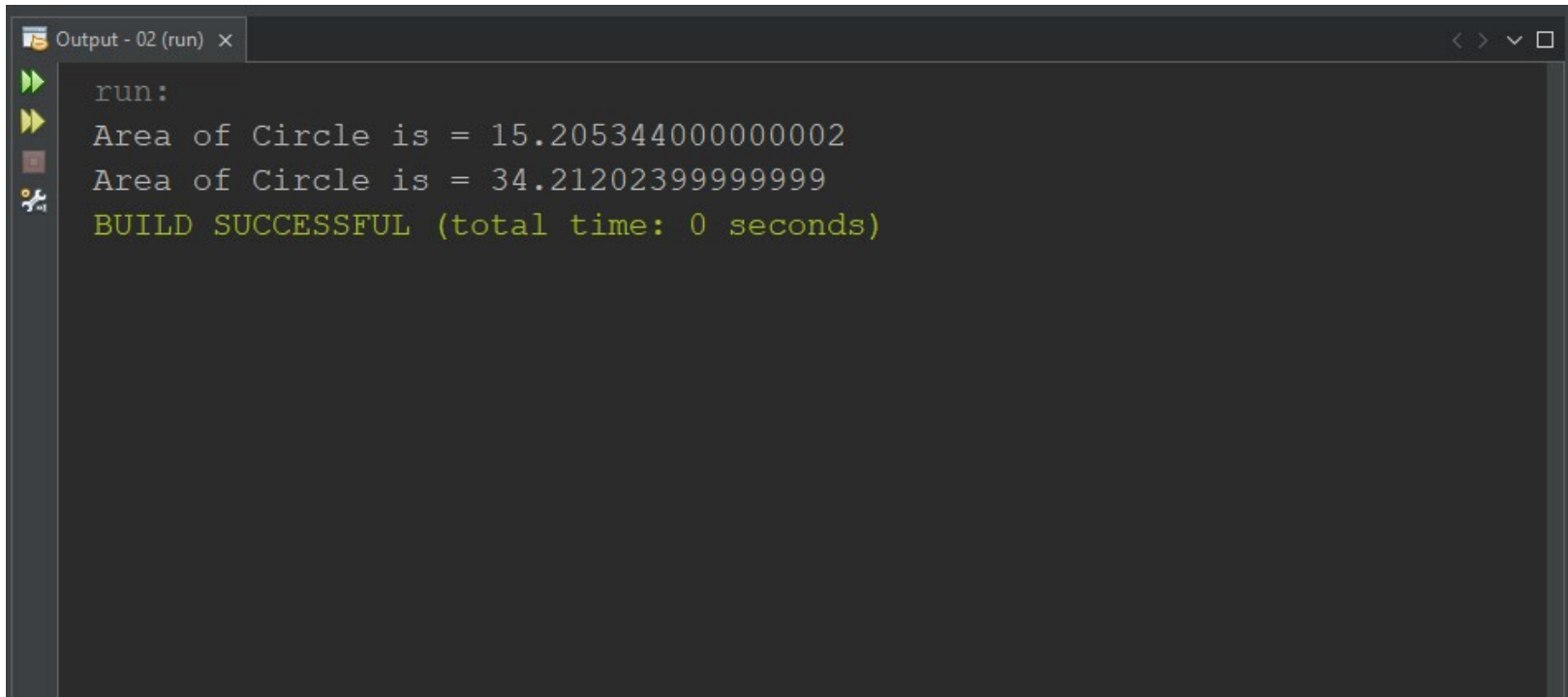
Conclusion: We created the class Circle and the instructed variables and a method that receives the radius of a circle returns the area of a circle. Then 2 objects are created that has a pre-defined values for radii. Using the method the areas of circles from the 2 objects are calculated and printed using the print syntax.

Problem 2 Task:

Implement the problem 1, where you set radius value using constructor.



```
1
2 public class CircleConst {
3
4     double Area;
5     double radius;
6
7     CircleConst(double r) {
8         radius = r;
9         Area = 3.1416 * r * r;
10        System.out.println("Area of Circle is = " + Area);
11    }
12
13    public static void main(String[] args) {
14        CircleConst r1 = new CircleConst(2.2);
15        CircleConst r2 = new CircleConst(3.3);
16
17    }
18
19 }
20
```

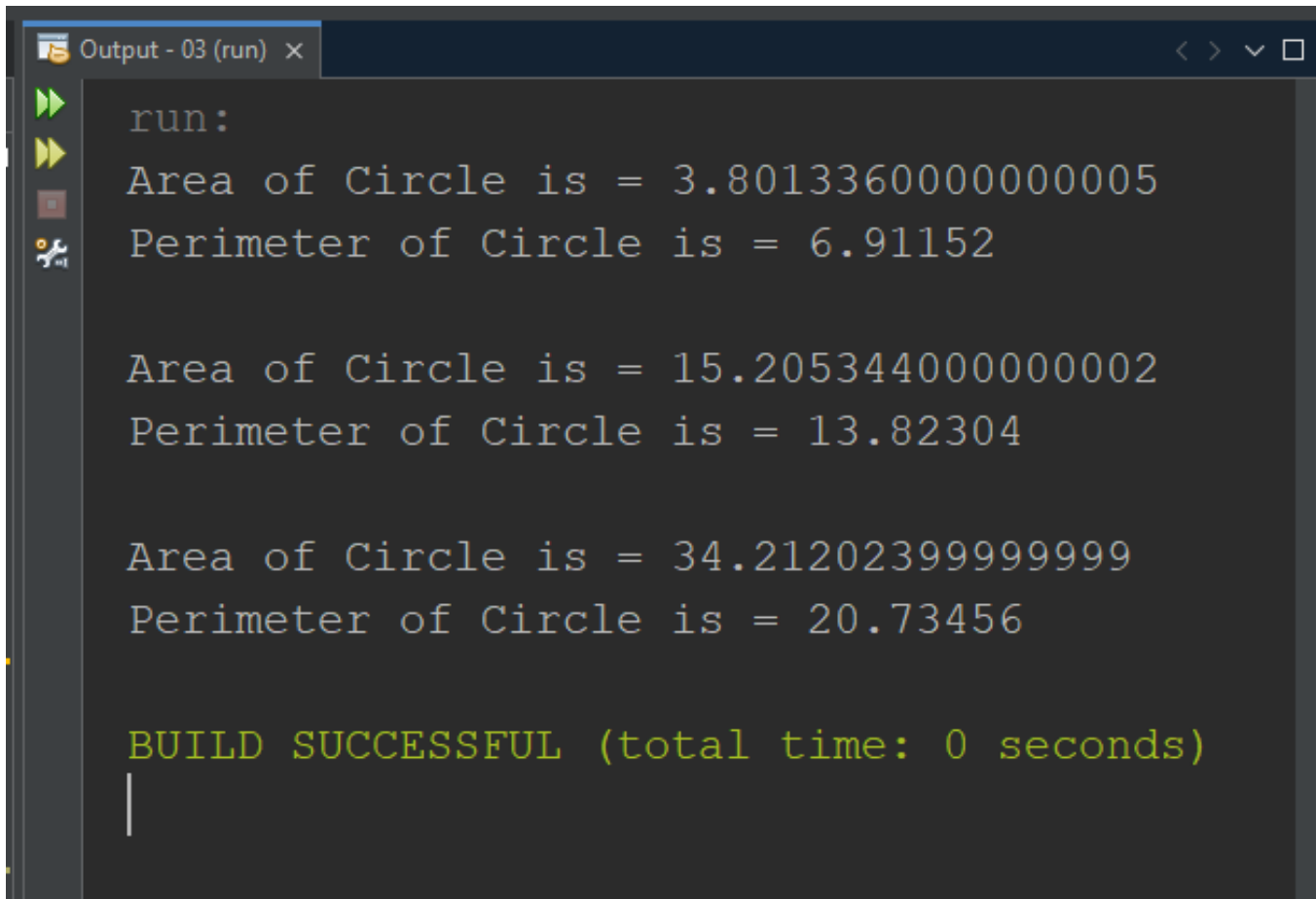
A screenshot of an IDE's output window. The window has a title bar that says "Output - 02 (run)" with a close button. On the left side of the window, there is a vertical toolbar with icons for running (a green play button), stepping through code (a yellow play button), and debugging (a red bug icon). The main area of the window displays the following text: "run:" on the first line, "Area of Circle is = 15.205344000000002" on the second line, "Area of Circle is = 34.212023999999999" on the third line, and "BUILD SUCCESSFUL (total time: 0 seconds)" on the fourth line in a yellow-green color.

```
run:
Area of Circle is = 15.205344000000002
Area of Circle is = 34.212023999999999
BUILD SUCCESSFUL (total time: 0 seconds)
```

Conclusion: We re-wrote the previous problem using only constructors which are called whenever objects are created. So, when an object is created, the value for radius is passed as arguments to a parameterized constructor. In there, it sets the radius value and calculates the area of the circle and assigns the result to a variable Area. Then it prints the values using the print syntax.

Problem 3 Task: Add a method or function of Circle class named perimeter which returns the perimeter of circle. Also, create a class containing constructor to set radius value. Now create three new objects and calculate their area and perimeter

```
Circle.java x
Source History
1
2 class Circle {
3
4     double radius;
5     double perimeter;
6
7     Circle(double r) {
8         radius = r;
9         System.out.println("Area of Circle is = " + 3.1416 * r * r);
10        System.out.println("Perimeter of Circle is = " + perimeter
11    (radius) + "\n");
12    }
13
14    double perimeter(double r) {
15        perimeter = 2 * 3.1416 * r;
16        return perimeter;
17    }
18
19    public static void main(String[] args) {
20        Circle c1 = new Circle(1.1);
21        Circle c2 = new Circle(2.2);
22        Circle c3 = new Circle(3.3);
23    }
```



```
Output - 03 (run) x
run:
Area of Circle is = 3.8013360000000005
Perimeter of Circle is = 6.91152

Area of Circle is = 15.205344000000002
Perimeter of Circle is = 13.82304

Area of Circle is = 34.212023999999999
Perimeter of Circle is = 20.73456

BUILD SUCCESSFUL (total time: 0 seconds)
```

Conclusion: a method named Perimeter was created which receives the radius values and returns the value of perimeter of a circle after calculating. Before this, a constructor was created which sets the value of radius when an object is created, and the constructor is called using parameters. Lastly, for 3 objects, the area is calculated and printed and the method Perimeter called which returns the value of perimeter of a circle which then is also printed using the print syntax.