

1.Problem Statement:

Create an abstract class Figure with following properties and functions:

Properties: Double dim1
Methods: abstract void findArea()
 abstract void findPerimeter();

Create three subclasses Circle,Rectangle and Triangle that extends Figure class and define both the methods.

Write a program that will find the area and perimeter of 3 figures and print details of all.

2.Source code:

```
/*Program to create an abstract class Figure with following properties and functions:
Properties Double dim1
Methods:abstract void findArea()
          abstract void findPerimeter();
```

```
Create three subclasses Circle,Rectangle and Triangle that extends Figure classand
define both the methods.
```

```
Write a program that will find the area and perimeter of 3 figures and print details
of all.
```

```
*/
```

```
package mypackage;
```

```
import java.util.Scanner;
```

```
//Creation of abstract class with two abstract methods
```

```
abstract class Figure
```

```
{
    double dim1;
    abstract void findArea();
    abstract void findPerimeter();
}
```

```
//Defining class Circle
```

```
class Circle extends Figure
```

```
{
    Circle(double r)
    {
        dim1=r;
    }
    //calculation of area for circle
    void findArea()
    {
        System.out.println("The area of Circle is :"+(3.14*(dim1*dim1)));
    }
    //calculation perimeter for circle
    void findPerimeter()
    {
        System.out.println("The Perimeter of circle is :"+
(2*3.14*dim1));
    }
}
```

```

class Rectangle extends Figure
{
    double dim2;
    Rectangle(double len,double wid)
    {
        dim1=len;
        dim2=wid;
    }
    //calculation of area for rectangle
    void findArea()
    {
        System.out.println("The area of Rectangle is :"+(dim1*dim2));
    }
    //calculation of perimeter for Rectangle
    void findPerimeter()
    {
        System.out.println("The Perimeter of Rectangle is
"+(2*(dim1+dim2)));
    }
}

```

```

class Triangle extends Figure
{
    double dim2;
    double dim3;
    double height;
    Triangle(double h,double side1,double side2, double baseside3)
    {
        dim1=side1;
        dim2=side2;
        dim3=baseside3;
        height=h;
    }
    //calculation of area for Triangle
    void findArea()
    {
        System.out.println("The area of Triangle is
:"+((dim3*height)/2));
    }
    //calculation of perimeter for Triangle
    void findPerimeter()
    {
        System.out.println("The Perimeter of Triangle is
"+(dim1+dim2+dim3));
    }
}

```

```

public class DemoAbstract {

    //Declaration of Main method
    public static void main(String[] args) {
        double radius;
        double lenth;
        double width;
        double side1,side2,side3,height;
        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the radius of circle:");
        radius =sc.nextDouble();
        //Creating Reference of Figure class
        Figure f;

        //Creating an object circle class and referring to parent class
reference
        f=new Circle(radius);
        //Calling the area method for circle
        f.findArea();
        //Calling the perimeter method for circle
        f.findPerimeter();

        System.out.println();
        System.out.println("*****");

        System.out.println("Enter the lenth of Rectangle:");
        lenth=sc.nextDouble();
        System.out.println("Enter the width of Rectangle:");
        width=sc.nextDouble();
        f=new Rectangle(lenth,width);
        //Calling the area method for Rectangle
        f.findArea();
        //Calling the perimeter method for Rectangle
        f.findPerimeter();

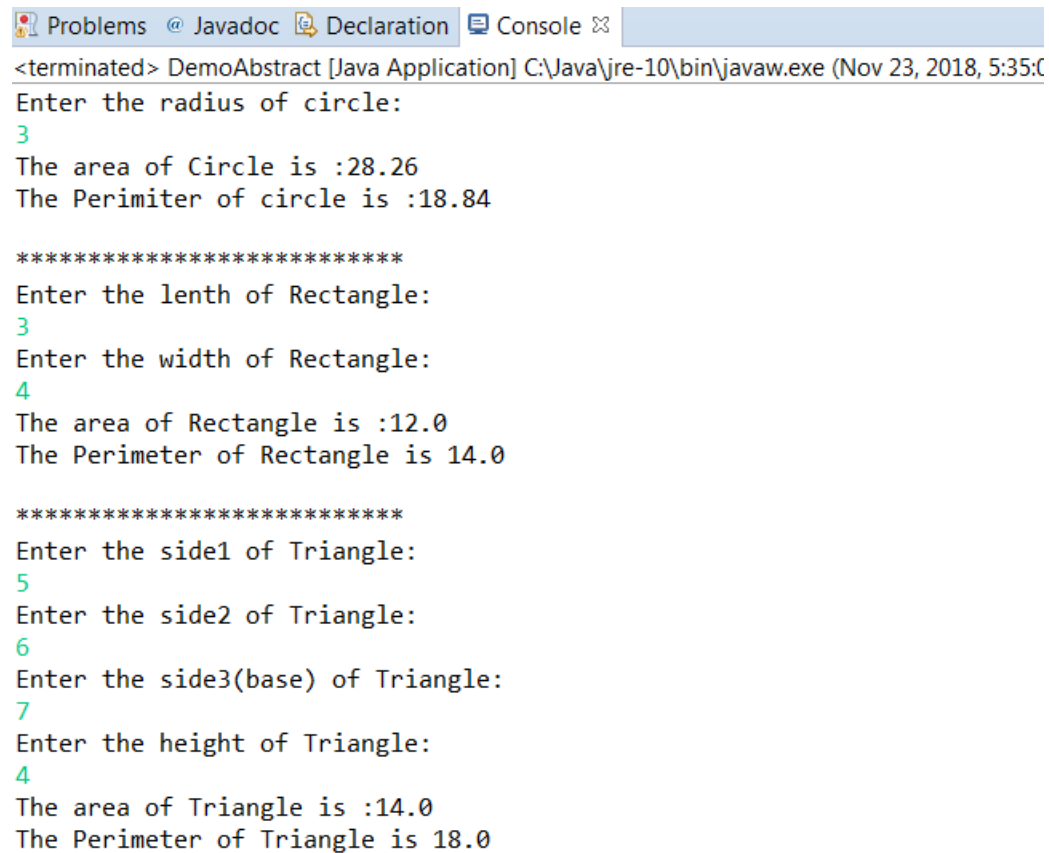
        System.out.println();
        System.out.println("*****");
        System.out.println("Enter the side1 of Triangle:");
        side1=sc.nextDouble();
        System.out.println("Enter the side2 of Triangle:");
        side2=sc.nextDouble();
        System.out.println("Enter the side3(base) of Triangle:");
        side3=sc.nextDouble();
        System.out.println("Enter the height of Triangle:");
        height=sc.nextDouble();

        //Calling the area method for Rectangle
        f=new Triangle(height,side1,side2,side3);
        //Calling the area method for Rectangle
        f.findArea();
        //Calling the perimeter method for Traingle
        f.findPerimeter();
    }
}

```

```
}//End of Program
```

3.Output



```
<terminated> DemoAbstract [Java Application] C:\Java\jre-10\bin\javaw.exe (Nov 23, 2018, 5:35:00 PM)
Enter the radius of circle:
3
The area of Circle is :28.26
The Perimeter of circle is :18.84

*****
Enter the lenth of Rectangle:
3
Enter the width of Rectangle:
4
The area of Rectangle is :12.0
The Perimeter of Rectangle is 14.0

*****
Enter the side1 of Triangle:
5
Enter the side2 of Triangle:
6
Enter the side3(base) of Triangle:
7
Enter the height of Triangle:
4
The area of Triangle is :14.0
The Perimeter of Triangle is 18.0
```

4.Flow Information

At first an abstract class Figure is declared with two abstract methods to find the area and perimeter. The definition of these two methods is defined in the sub classes Rectangle, Circle and Triangle of the parent class Figure. User is asked to enter the dimensions for each of it and an object is created for each subclass and referred to parent class reference of Figure. The dimensions are passed using constructors and called the area and perimeter methods with help of created objects. Finally, an output is displayed with area and perimeter of rectangle, circle and triangle.