24/10/2023

LAB-4

Q. Develop a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named rectangle, triangle, circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.

```
import java.util.Scanner;
abstract class Shape{
  int dim1, dim2;
  abstract void printArea();
}
class Rectangle extends Shape{
    public Rectangle(int dim1, int dim2(w){
          this.dim1=l;
          this.dim2=w;
    }
    void printArea(){
     int area=dim1*dim2;
     System.out.println("Rectangle area= "+area);
    }
}
class Triangle extends Shape{
    public Triangle(int b, int h){
          this.dim1=b;
          this.dim2=h;
    }
    void printArea(){
    float area=0.5*dim1*dim2;
    System.out.println("Triangle area= "+area);
    }
}
class Circle extends Shape{
  private final double pi=3.14;
    public Circle(int r){
  }   this.dim1=r;
  void printArea(){
     float area=pi*dim1*dim1;
```

```
        System.out.println("Circle area: "+area);
    }
}
public class Main{
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter rectangle length: ");
        int length=sc.nextInt();
        System.out.println("Enter rectangle width: ");
        int width=sc.nextInt();
        System.out.println("Enter triangle base: ");
        Rectangle rectangle=new Rectangle(l,w);
        rectangle.printArea();
        S.O.P("Enter triangle base: ");
        int base=sc.nextInt();
        S.O.P("Enter triangle height: ");
        int height=sc.nextInt();
        Triangle triangle=new Triangle(b,h);
        triangle.printArea();
        S.O.P("Enter radius of circle: ");
        int radius=sc.nextInt();
        Circle circle=new Circle(radius);
        circle.printArea();
    }
}
```

Output:-

```
Enter length of rectangle=10
Enter width of rectangle=5
Rectangle area=50
Enter base of triangle=8
Enter height of triangle=5
Triangle area=20.0
Enter radius of circle=10
Circle area=314.0
```

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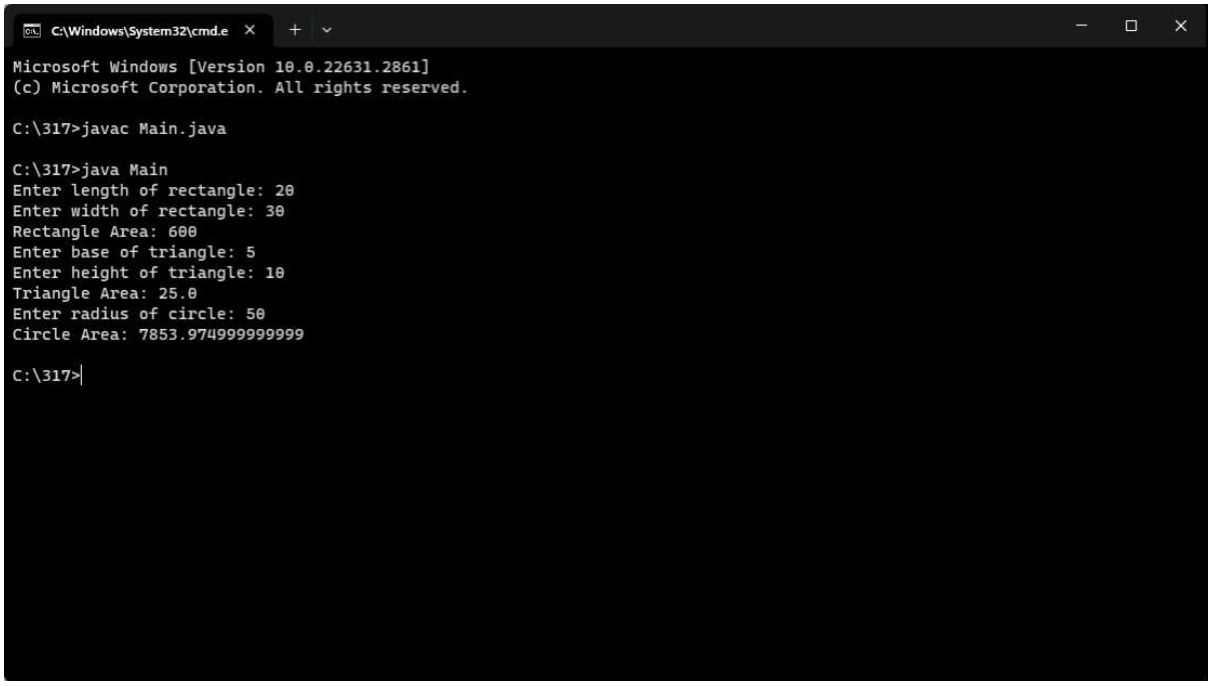
```
import java.util.Scanner;


abstract class Shape {
    int dimension1;
    int dimension2;


    abstract void printArea();
}

class Rectangle extends Shape {


    public Rectangle(int length, int width) {
        this.dimension1 = length;
        this.dimension2 = width;
    }


    void printArea() {
        int area = dimension1 * dimension2;
        System.out.println("Rectangle Area: " + area);
    }
}

class Triangle extends Shape {


    public Triangle(int base, int height) {
        this.dimension1 = base;
        this.dimension2 = height;
    }



    void printArea() {
        double area = 0.5 * dimension1 * dimension2;
        System.out.println("Triangle Area: " + area);
    }
}

class Circle extends Shape {
    private final double pi = 3.14159;


    public Circle(int radius) {
        this.dimension1 = radius;
        this.dimension2 = 0;
    }
```

```
    void printArea() {
        double area = pi * dimension1 * dimension1;
        System.out.println("Circle Area: " + area);
    }
}
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);



        System.out.print("Enter length of rectangle: ");
        int length = scanner.nextInt();
        System.out.print("Enter width of rectangle: ");
        int width = scanner.nextInt();
        Rectangle rectangle = new Rectangle(length, width);
        rectangle.printArea();


        System.out.print("Enter base of triangle: ");
        int base = scanner.nextInt();
        System.out.print("Enter height of triangle: ");
        int height = scanner.nextInt();
        Triangle triangle = new Triangle(base, height);
        triangle.printArea();

        System.out.print("Enter radius of circle: ");
        int radius = scanner.nextInt();
        Circle circle = new Circle(radius);
        circle.printArea();

        scanner.close();
    }
}
```


C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22631.2861]
(c) Microsoft Corporation. All rights reserved.
C:\317>javac Main.java
C:\317>java Main
Enter length of rectangle: 20
Enter width of rectangle: 30
Rectangle Area: 600
Enter base of triangle: 5
Enter height of triangle: 10
Triangle Area: 25.0
Enter radius of circle: 50
Circle Area: 7853.974999999999
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