## LAB program 4

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 and 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.

## CODE:

```
import java.util.Scanner;
abstract class Shape {
    int dimension1;
    int dimension2;
    public Shape(int dim1, int dim2) {
        this.dimension1 = dim1;
        this.dimension2 = dim2;
    }
    abstract void printArea();
}
class Rectangle extends Shape {
    public Rectangle(int length, int width) {
        super(length, width);
    }
    @Override
    void printArea() {
        int area = dimension1 * dimension2;
        System.out.println("Rectangle Area: " + area);
    }
}
class Triangle extends Shape {
    public Triangle(int base, int height) {
        super(base, height);
    }
```

```
@Override
    void printArea() {
        double area = 0.5 * dimension1 * dimension2;
        System.out.println("Triangle Area: " + area);
    }
}
class Circle extends Shape {
    public Circle(int radius) {
        super(radius, 0);
    }
    @Override
    void printArea() {
        double area = Math.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.println("Choose a shape to calculate area:");
        System.out.println("1. Rectangle");
        System.out.println("2. Triangle");
        System.out.println("3. Circle");
        int choice = scanner.nextInt();
        switch (choice) {
            case 1:
                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();
                break;
            case 2:
                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();
    break;

case 3:
        System.out.print("Enter radius of Circle: ");
        int radius = scanner.nextInt();
        Circle circle = new Circle(radius);
        circle.printArea();
        break;

default:
        System.out.println("Invalid choice. Please choose 1, 2, or 3.");
        break;
}
scanner.close();
}
```

## OUTPUT:

```
Choose a shape to calculate area:
1. Rectangle
2. Triangle
3. Circle
Enter length of Rectangle: 10
Enter width of Rectangle: 20
Rectangle Area: 200
Choose a shape to calculate area:
1. Rectangle
2. Triangle
3. Circle
2
Enter base of Triangle: 10
Enter height of Triangle: 15
Triangle Area: 75.0
Choose a shape to calculate area:
1. Rectangle
2. Triangle
3. Circle
Enter radius of Circle: 7
Circle Area: 153.93804002589985
Choose a shape to calculate area:
```

```
1. Rectangle
```

- 2. Triangle
- 3. Circle

4

Invalid choice. Please choose 1, 2, or 3.

## **OBSERVATION:**

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2) Lab program 4 198 16 miles along and
 sevelop a Java program to create an abstract
class named shape that contains two integers
and an empty method named point Area ().

Provide three classes named Rectangle, Towards
 and circle such that each one of the classes
extends the class shape Each one of the classes
contain only the method front Auaci that prints
 the area of the given shape.
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 import java. util. * >
abstract class shape 1
       Scanner Sc= new Scanner (System . Pr.);
       int side 1;
       ind sided; il produkt 1 " ) took
       abstract void printaria ();
class sectangle extends shape 1
void print Arua () L
           sout ("Enter length and breadth:");
            side1 = sc. restInt();
            Side 2 = Sc. next Int ();
           Sout (" Area of Rutangle" + (side 1 * side 2);
             to provide bruse Of
class topangle extends shape 1
               system. out. pointln ("Enter base and Height:)
                side 1 = sc. nextInt ();
                 side = sc. nent (1 (3);
              Sout (" Area of Triangle: "+(0.5 + side + struct),
```

```
world printared () &
      sout ("Enter Radius of Orde: ").
       side 1 - sc. next Int O;
              sout (" Brea of wicle: "+ (3.1445)de 1457de
   Public class print 1
                  static void main (string [] args) (
          Public
              Sout (" Enter shape of your Choice: ");
Scanner sc = reco Scanner ( System. in);
              while (true) !
                  soud [" 1. Rutangle In 2. Triangle in
                    3. Circle In 4. Exit "s
                    int choice = sc. rent Int ();
                    switch (charce) 1.
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                         rectangle ot = new rectangle ();
ot. point Aua ();
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                         breaks
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                         tolangle t= new tolangle ();
                         t. proint Area ();
                          preak;
                         Case 3:
                         Circle ( = new Circle ():
                         C. proint Area ():
renter base and
                         break;
                        case 4:
                     sout ( " Exiting the program ....)
                     System ent (0);
```

```
enter shape of your choice:
  1. Rectargle
  2. Triangle
  3. circle
  4. Exit
 Enter length and Breadth:
  Alua of Rictarde : 8
  1. Rutangle
  2. Tolangle.
  3. circle
 To Exet.
  enter base and Height:
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  Inkertangle rul award ut overeby sit more
  2. Porangle war you with war to the transmit
   3. Circles of abulant other maringale recent
 on the swit
             order to achieve
    11300399 remoteur mary disept iques (0
                       update other balance
   1 Rectangle
   2. Triangle
                       3 sisplay the balance
   3. Circle
           a) compute and deposit interest
a permit withdrawal and update the belone
   of shishary and shorter balance. James
```