

```

import java.util.Scanner;
abstract class Shape {
    int dim1;
    int dim2;

    Shape(int dim1, int dim2) {
        this.dim1 = dim1;
        this.dim2 = dim2;
    }

    abstract void printArea();
}
class Rectangle extends Shape {
    Rectangle(int length, int width) {
        super(length, width);
    }

    void printArea() {
        int area = dim1 * dim2;
        System.out.println("Area of Rectangle: " + area);
    }
}
class Triangle extends Shape {
    Triangle(int base, int height) {
        super(base, height);
    }

    void printArea() {
        double area = 0.5 * dim1 * dim2;
        System.out.println("Area of Triangle: " + area);
    }
}
class Circle extends Shape {
    public Circle(int radius) {
        super(radius, 0);
    }
}

```

```

    }

    public void printArea() {
        double area = Math.PI * dim1 * dim1;
        System.out.println("Area of Circle: " + area);
    }
}

class Calc {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Select a shape:");
        System.out.println("1. Rectangle");
        System.out.println("2. Triangle");
        System.out.println("3. Circle");

        int choice = scanner.nextInt();
        Shape shape=null;
        switch (choice) {
            case 1:
                System.out.println("Enter length of rectangle:");
                int length = scanner.nextInt();
                System.out.println("Enter width of rectangle:");
                int width = scanner.nextInt();
                shape = new Rectangle(length, width);
                break;
            case 2:
                System.out.println("Enter base of triangle:");
                int base = scanner.nextInt();
                System.out.println("Enter height of triangle:");
                int height = scanner.nextInt();
                shape = new Triangle(base, height);
                break;
            case 3:

```

```
        System.out.println("Enter radius of circle:");
        int radius = scanner.nextInt();
        shape = new Circle(radius);
        break;
    default:
        System.out.println("Invalid choice");
        return;
    }

    shape.printArea();
}
}
```

```
C:\1BM23CS321>java Calc
```

```
Select a shape:
```

- 1. Rectangle
- 2. Triangle
- 3. Circle

```
1
```

```
Enter length of rectangle:
```

```
12
```

```
Enter width of rectangle:
```

```
11
```

```
Area of Rectangle: 132
```

```
C:\1BM23CS321>java Calc
```

```
Select a shape:
```

- 1. Rectangle
- 2. Triangle
- 3. Circle

```
2
```

```
Enter base of triangle:
```

```
12
```

```
Enter height of triangle:
```

```
12
```

```
Area of Triangle: 72.0
```

```
C:\1BM23CS321>java Calc
```

```
Select a shape:
```

- 1. Rectangle
- 2. Triangle
- 3. Circle

```
3
```

```
Enter radius of circle:
```

```
12
```

```
Area of Circle: 452.3893421169302
```

```
C:\1BM23CS321>_
```

LAB PROGRAM - 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 and circle such that each one of the class extends class Shape. Each one of the classes contain only the method printArea() that prints area of the given shape.

```
import java.util.Scanner;
abstract class Shape {
    int dim1, dim2;

    public Shape (int dim1, int dim2) {
        this.dim1 = dim1;
        this.dim2 = dim2;
    }

    abstract double printArea();
}

class Rectangle extends Shape {
    public Rectangle (dim1, dim2) {
        super (dim1, dim2);
    }

    void printArea() {
        double area = dim1 * dim2;
        System.out.println (area);
    }
}

class Triangle extends Shape {
    public Triangle (dim1, dim2) {
        super (dim1, dim2);
    }

    void printArea() {
        double area = 0.5 * dim1 * dim2;
        System.out.println (area);
    }
}
```


Class Circle extends Shape {

public Circle (int dim1)

super (dim1, dim2);

void printArea();

double area = Math.PI * dim1 * dim1;

System.out.println (Area);

public class ShapeArea {

public static void main (String[] args) {

int choice;

sc. Scanner. nextInt

switch (choice) {

case 1 : "Enter dimensions of Rect"

int a = nextInt();

int b = sc.nextInt();

Rectangle r = new Rectangle(a,b)

r.printArea();

break;

case 2 : "Triangle"

int base = sc.nextInt();

int height = sc.nextInt();

Triangle t = new Triangle
(base, height)

t.printArea();

break;

Output ⇒

Select a shape : 1. Rectangle 2. Triangle 3. Circle 1.

Enter length of Rectangle : 12

Enter length of Rectangle : 12

Area : 132