

WEEK 4

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.

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

```
abstract class Shape{
    int b,h;
    void printArea(){}
}
```

```
class Rectangle extends Shape{
    Rectangle(int a,int c){
        b=a;
        h=c;
    }
    void printArea(){
        System.out.println("Area of the rectangle is "+(b*h));
    }
}
```

```
class Triangle extends Shape{
    Triangle(int a,int c){
        b=a;
        h=c;
    }
    void printArea(){
        System.out.println("Area of the triangle is "+(b*h/2));
    }
}
```

```
class Circle extends Shape{
    Circle(int a){
        b=h=a;
    }
    void printArea(){
        System.out.println("Area of the circle is "+(Math.PI*b*h));
    }
}
```

```
}  
}
```

```
class Lab_4{  
    public static void main(String[] args) {  
        Scanner s=new Scanner(System.in);  
        int shape;  
        System.out.println("Enter the shape\n1.Rectangle\n2.Triangle\n3.Circle\n4.Exit");  
        do {  
            shape=s.nextInt();  
            if(shape==1){  
                System.out.println("Enter breadth and height");  
                int a=s.nextInt();  
                int c=s.nextInt();  
                Rectangle r=new Rectangle(a, c);  
                r.printArea();  
            }else if(shape==2){  
                System.out.println("Enter side length and height");  
                int a=s.nextInt();  
                int c=s.nextInt();  
                Triangle r=new Triangle(a, c);  
                r.printArea();  
            }else if(shape==3){  
                System.out.println("Enter radius");  
                int a=s.nextInt();  
                Circle r=new Circle(a);  
                r.printArea();  
            }  
        }while (shape!=4);  
        s.close();  
    }  
}
```

```
Enter the shape
1.Rectangle
2.Triangle
3.Circle
4.Exit
1
Enter breadth and height
2 4
Area of the rectangle is 8
2
Enter side length and height
2 4
Area of the triangle is 4
3
Enter radius
1
Area of the circle is 3.141592653589793
4
```

4. Develop an abstract class Shape which has two integers and has a method to printArea. Develop 3 child classes for Rectangle, Triangle, Circle.

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

```
abstract class Shape {  
    int b, h;  
    void printArea() {}  
}
```

```
class Rectangle extends Shape {  
    Rectangle (int a, int c) {  
        b = a;  
        h = c;  
    }  
    void printArea () {  
        System.out.println ("Area of the rectangle is "  
        + (b*h));  
    }  
}
```

```
class Triangle extends Shape {  
    Triangle (int a, int c) {  
        b = a;  
        h = c;  
    }  
    void printArea () {  
        System.out.println ("Area of the triangle is "  
        + (b*b/h));  
    }  
}
```

Circle class Circle extends Shape {

Circle (int a) {

b=h=a;

}

void printArea() {

System.out.println("Area of the circle is "

+ (Math.PI * b * h));

}

}

class Lab 4E

public static void main (String args[]) {

Scanner s = new Scanner (System.in);

int shape;

System.out.println("Enter the shape\n

1. Rectangle\n 2. Triangle\n 3. Circle\n 4. Exit");

do {

shape = s.nextInt();

if (shape == 1) {

System.out.println("Enter breadth and height");

int a = s.nextInt();

int c = s.nextInt();

Rectangle r = new Rectangle (a,c);

r.printArea();

} else if (shape == 2) {

System.out.println("Enter side length and height");

int a = s.nextInt();

int c = s.nextInt();

Triangle t = new Triangle (a,c);

t.printArea();

} else if (shape == 3) {

System.out.println("Enter radius");


```

int a = s.nextInt();
Circle c = new Circle(a);
c.printArea();

```

```

}
while (shape != 4);
}
}

```

Output:

Enter the shape

1. Rectangle

2. Triangle

3. Circle

4. Exit

1.

Enter breadth and height

10 5

Area of rectangle is 50

2

Enter side length and height

10 5

Area of triangle is 25

3

Enter radius

1

Area of circle 3.14

4