Session 4 – Assignment 1

Problem Statement

1. 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 the

details for all.

Solution

```
//abstract class Figure
import java.lang.Math;
abstract class Figure {
 double dim1;
 abstract void findArea();
 abstract void findPerimeter();
 }
//Create subclass Circle
class Circle extends Figure
 {
 double r=5;
 void findArea()  {
  dim1 = Math.PI * r * r;
   System.out.println("area of Circle -->"+dim1);
   }
 void findPerimeter()  {
  dim1 = Math.PI * 2 * r;
        // P = 2*pi*r
```
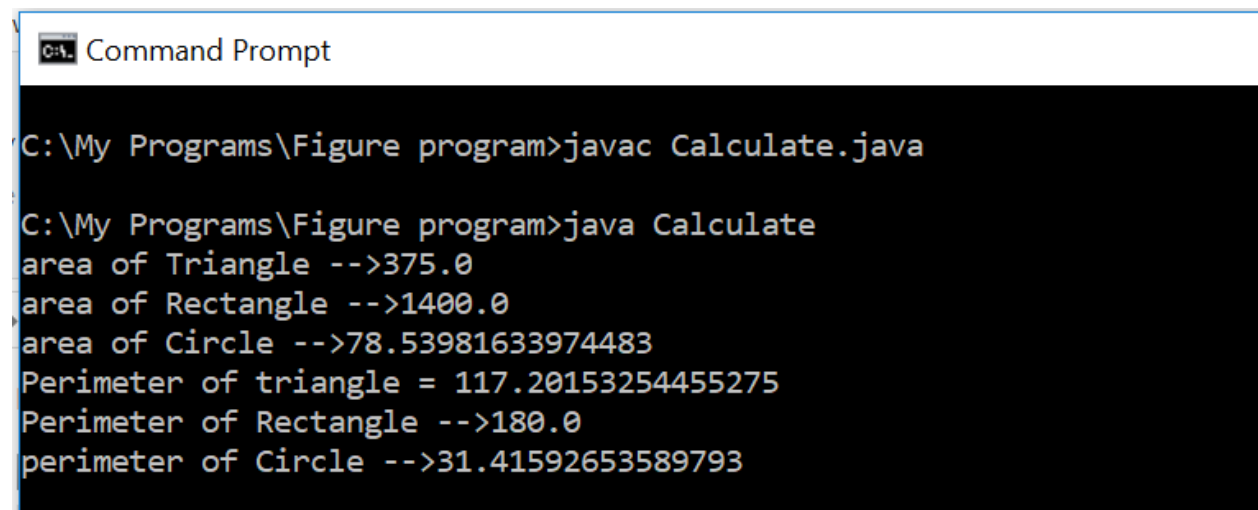
```java
    System.out.println("perimeter of Circle -->"+dim1);

  }

}
```

//Create subclass Rectangle

```java
class Rectangle extends Figure {

 double w=70,h=20;

 double P=2*(w+h);

 void findArea() {

  dim1 = w*h;

  System.out.println("area of Rectangle -->"+dim1);

  }

void findPerimeter(){

  dim1 = 2 * (w +h);

  System.out.println("Perimeter of Rectangle -->" +dim1);

 }

}
```

//Create subclass Triangle

```java
class Triangle extends Figure

{

 double b=50,h=15;double hypotenuse;

 void findArea()  {

  dim1 = (b*h)/2;

  System.out.println("area of Triangle -->"+dim1);

 }

 void findPerimeter() {

hypotenuse = Math.pow(Math.pow(b, 2) + Math.pow(h, 2),0.5);

dim1 = b + h + hypotenuse;

System.out.println("Perimeter of triangle = " + dim1);

 }
```

```
}
//Create class Calculate

class Calculate {

 public static void main(String [] args)

 {

  Triangle t= new Triangle();

  Rectangle r =new Rectangle();

  Circle c =new Circle();

  t.findArea();

  r.findArea();

  c.findArea();

  t.findPerimeter();

  r.findPerimeter();

  c.findPerimeter();

 }

}
```



```
Command Prompt

C:\My Programs\Figure program>javac Calculate.java

C:\My Programs\Figure program>java Calculate
area of Triangle -->375.0
area of Rectangle -->1400.0
area of Circle -->78.53981633974483
Perimeter of triangle = 117.20153254455275
Perimeter of Rectangle -->180.0
perimeter of Circle -->31.41592653589793
```