EX: 05	AREA CALCULATOR
22-08-2019	

Aim:

To develop a java console application to perform area calculation using abstract classes.

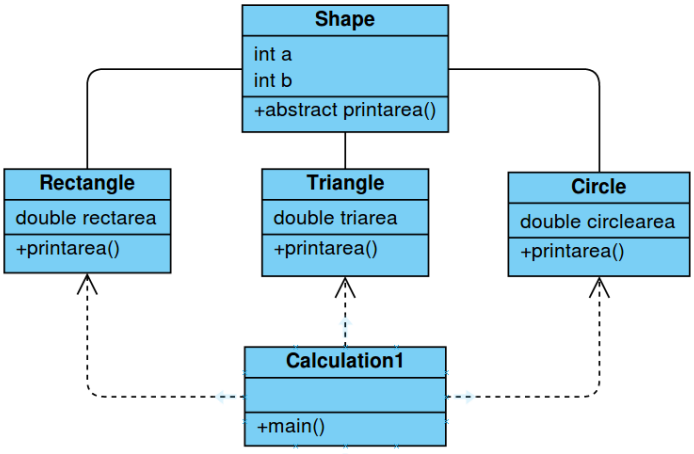
Requirement:

Create an abstract class named Shape that contains two integers and an empty method named print Area(). Three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

Algorithm:

Step 1: Create class StringList with static main function in package stringcollection.
Step 2: Use switch case to perform necessary tasks.
Step 3: Use add() method to add a string.
Step 4: Use same add() method to add a string at particular index.
Step 5: Use indexOf() method to search for a string.
Step 6: Compare first letter of the strings from the list with the entered letter and display those particular strings.
Step 7: Exit

Class Diagram:



Program:

Shape.java

```
/*developed by: Sanjai Kumar
* gsanjaik@gmail.com
*/
package shapecollection;

public abstract class Shape {
```

```
     int a,b;
     public abstract void printArea();
}
```

Rectangle.java

```
/*developed by: Sanjai Kumar
* gsanjaik@gmail.com
*/
package shapecollection;
import java.util.Scanner;
public class Rectangle extends Shape{
     double rectarea;
     public void printArea() {
          Scanner sc=new Scanner(System.in);
          System.out.print("Enter the length and breadth of the
               rectangle: \n");
          a=sc.nextInt();
          b=sc.nextInt();
          rectarea=a*b;
          System.out.printf("The length and the breadth of the
          are"+a+" and "+b+" and its area is"+rectarea);
     }
}
```

Triangle.java

```
/*developed by: Sanjai Kumar
* gsanjaik@gmail.com
*/
package shapecollection;
import java.util.Scanner;
public class Triangle extends Shape{
          double triarea;
          public void printArea() {
               Scanner sc=new Scanner(System.in);
               System.out.print("Enter the base and height of the
               triangle: \n");
               a=sc.nextInt();
               b=sc.nextInt();
               triarea=(0.5)*a*b;
               System.out.printf("The height and the width of the
               triangle are"+a+" and "+b+" and its area is
               "+triarea);
          }
}
```

Circle.java

```
/*developed by: Sanjai Kumar
* gsanjaik@gmail.com
*/
package shapecollection;
import java.util.Scanner;
public class Circle extends Shape{
```

```
     double circlearea;
     public void printArea() {
          Scanner sc=new Scanner(System.in);
          System.out.print("Enter the radius of the circle: \n");
          a=sc.nextInt();
          circlearea=(3.14)*a*a;
          System.out.printf("The radius of the circle is "+a+" and
          its area is "+circlearea);
     }
}
```

Calculation1.java

```
/*developed by: Sanjai Kumar
* gsanjaik@gmail.com
*/
package shapecollection;
import java.util.Scanner;
public class Calculation1 {
     public static void main(String[] args) {
          Rectangle r=new Rectangle();
          Triangle t=new Triangle();
          Circle c=new Circle();
          int option;
          Scanner sc=new Scanner(System.in);
          while(true) {
               System.out.println("\n Enter the shape of area you
               want to calculate: ");
               System.out.println("1.Rectangle");
               System.out.println("2.Triangle");
               System.out.println("3.Circle");
               System.out.println("4.Exit");
               option=sc.nextInt();
               switch(option)
               {
               case 1:
                    r.printArea();
                    break;
               case 2:
                    t.printArea();
                    break;
               case 3:
                    c.printArea();
                    break;
               case 4:
                    System.out.println("Thanks for using the
                    application!");
                    break;
               default:
                    System.out.println("Enter a valid option!!");
               }
               if(option==4)
```

```
                    break;
            }
        }
}
```

Output:

```
Enter the shape of area you want to calculate:
1.Rectangle
2.Triangle
3.Circle
4.Exit
1
Enter the length and breadth of the rectangle:
4
5
The length and the breadth of the rectangle are4 and 5 and its area is 20.0
 Enter the shape of area you want to calculate:
1.Rectangle
2.Triangle
3.Circle
4.Exit
2
Enter the base and height of the triangle:
4
5
The height and the width of the triangle are4 and 5 and its area is 10.0
 Enter the shape of area you want to calculate:
1.Rectangle
2.Triangle
3.Circle
4.Exit
3
Enter the radius of the circle:
1
The radius of the circle is 1 and its area is 3.14
 Enter the shape of area you want to calculate:
1.Rectangle
2.Triangle
3.Circle
4.Exit
4
Thanks for using the application!
```

Result:

Thus the java application for area calculation is executed and the output is verified succesfully.