Aim:

Define an interface "Geometric Shape" with methods area( ) and perimeter( ) (Both method's return type and parameter list should be void and empty respectively.)

Define classes like Triangle, Rectangle, and Circle implementing the "Geometric Shape" interface and calculate the area and perimeter of the respective Triangle, Rectangle, and Circle and also define the "Execute Main" class which includes the main method to test the above class.

Source Code:

ExecuteMain.java

```java
import java.io.*;
import java.util.*;
class ExecuteMain
{
   public static void main(String args[])
   {
      GeometricShape gs;
      Scanner s = new Scanner(System.in);
      System.out.println("Choose a geometric shape:");
      System.out.println("1.Triangle");
      System.out.println("2.Rectangle");
      System.out.println("3.Circle");
      System.out.println("Enter your choice:");
      int choice = s.nextInt();
      switch(choice)
      {
         case 1:
            System.out.println("Enter lengths of the three sides of Triangle:");
            double l=s.nextDouble();
            double b=s.nextDouble();
            double h=s.nextDouble();
            gs = new Triangle(l,b,h);
            gs.area();
            gs.perimeter();
            break;
         case 2:
            System.out.println("Enter length and breadth of Rectangle:");
            double l1=s.nextDouble();
            double b1=s.nextDouble();
            gs = new Rectangle(l1,b1);
            gs.area();
            gs.perimeter();
            break;
         case 3:
            System.out.println("Enter radius of Circle:");
            double r =s.nextDouble();
            gs=new Circle(r);
            gs.area();
            gs.perimeter();
            break;
         default:
```

```java
            System.out.println("Invalid choice");
        }
    }
}
interface GeometricShape
{
    void area();
    void perimeter();
}
class Triangle implements GeometricShape
{
    private double l,b,h;
    public Triangle(double l,double b,double h)
    {
        this.l=l;
        this.b=b;
        this.h=h;
    }
    public void area()
    {
        double area;
        area=(l*b)/2;
        System.out.println("Area of Triangle:"+area);
    }
    public void perimeter()
    {
        double p;
        p=(l+b+h);
        System.out.println("Perimeter of Triangle:"+p);
    }
}
class Rectangle implements GeometricShape
{
    private double length,breadth;
    public Rectangle(double length,double breadth)
    {
        this.length=length;
        this.breadth=breadth;
    }
    public void area()
    {
        double a=length*breadth;
        System.out.println("Area of Rectangle:"+a);
    }
    public void perimeter()
    {
        double p=2.0*(length+breadth);
        System.out.println("Perimeter of Rectangle:"+p);
    }
}
class Circle implements GeometricShape
{
    private double r;
    public Circle(double r)
    {
        this.r=r;
```

```
    }
    public void area()
    {
        double a=(Math.PI)*r*r;
        System.out.println("Area of Circle:"+a);
    }
    public void perimeter()
    {
        double p = 2.0*Math.PI*r;
        System.out.println("Circumference of Circle:"+p);
    }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Choose a geometric shape: 1
1.Triangle 1
2.Rectangle 1
3.Circle 1
Enter your choice: 1
Enter lengths of the three sides of Triangle: 3 4 5
Area of Triangle:6.0
Perimeter of Triangle:12.0

Test Case - 2
User Output
Choose a geometric shape: 5
1.Triangle 5
2.Rectangle 5
3.Circle 5
Enter your choice: 5
Invalid choice