

```
1 package com.company.InheritanceProblem;  
2  
3 public abstract class Shape {  
4     public abstract void GetInfosAboutShape();  
5 }  
6
```

```
1 package com.company.InheritanceProblem;
2
3 public abstract class ThreeDimensionShape extends TwoDimensionShape{
4     private double volume;
5
6     public abstract double calculateVolume();
7 }
8
```

```
1 package com.company.InheritanceProblem;
2
3 public abstract class TwoDimensionShape extends Shape {
4
5     public abstract double calculateArea();
6     public abstract double calculatePerimeter();
7 }
8
```

```
1 package com.company.InheritanceProblem;
2
3 public class Cube extends ThreeDimensionShape{
4
5     private double side1;
6
7     public Cube(double side1){
8         this.side1 = side1;
9     }
10
11     @Override
12     public void GetInfosAboutShape() {
13         System.out.println("Shape : "+this.getClass().getName().replace("com.company.InheritanceProblem.", ""));
14         System.out.println("Volume : "+calculateVolume());
15         System.out.println("Area : "+calculateArea());
16         System.out.println("Perimeter : "+calculatePerimeter());
17     }
18
19     @Override
20     public double calculateArea() {
21         return 6 * Math.pow(side1,2);
22     }
23
24     @Override
25     public double calculatePerimeter() {
26         return 12 * Math.pow(side1,4);
27     }
28
29     @Override
30     public double calculateVolume() {
31         return Math.pow(side1,3);
32     }
33 }
34
```

```
1 package com.company.InheritanceProblem;
2
3 public class Prism extends ThreeDimensionShape{
4     private double side1;
5     private double side2;
6     private double side3;
7
8     public Prism(double side1, double side2, double side3){
9         this.side1 = side1;
10        this.side2 = side2;
11        this.side3 = side3;
12    }
13    @Override
14    public void GetInfosAboutShape() {
15        System.out.println("Shape : "+this.getClass().getName().replace("com.company.InheritanceProblem.", ""));
16        System.out.println("Volume : "+calculateVolume());
17        System.out.println("Area : "+calculateArea());
18        System.out.println("Perimeter : "+calculatePerimeter());
19    }
20
21    @Override
22    public double calculateVolume() {
23        return side1*side2*side3;
24    }
25
26    @Override
27    public double calculateArea() {
28        return 2 * ((side1*side2) + (side1*side3) + (side2*side3));
29    }
30
31    @Override
32    public double calculatePerimeter() {
33        return 8 * (side1+side2+side3);
34    }
35 }
36
```

```
1 package com.company.InheritanceProblem;
2
3 public class Rectangle extends TwoDimensionShape{
4     private double side1;
5     private double side2;
6
7     public Rectangle(double side1, double side2){
8         this.side1 = side1;
9         this.side2 = side2;
10    }
11
12    @Override
13    public double calculateArea() {
14        return side1 * side2;
15    }
16
17    @Override
18    public double calculatePerimeter() {
19        return 2 * (side1 + side2);
20    }
21
22    public double getSide2() {
23        return side2;
24    }
25
26    public void setSide2(double side2) {
27        this.side2 = side2;
28    }
29
30    public double getSide1() {
31        return side1;
32    }
33
34    public void setSide1(double side1) {
35        this.side1 = side1;
36    }
```

```
37
38     @Override
39     public void GetInfosAboutShape() {
40         System.out.println("Shape : "+this.getClass().getName().replace("com.company.InheritanceProblem.", ""));
41         System.out.println("Area : "+calculateArea());
42         System.out.println("Perimeter : "+calculatePerimeter());
43     }
44 }
45
```

```
1 package com.company.InheritanceProblem;
2
3 public class Square extends Rectangle{
4
5     public Square(double side1) {
6         super(side1, side1);
7     }
8 }
9
```



```
1 package com.company.InheritanceProblem;
2
3 public class Circle extends TwoDimensionShape {
4     private double radius;
5
6     public Circle(double radius) {
7         this.radius = radius;
8     }
9
10    @Override
11    public double calculateArea() {
12        return Math.PI * Math.pow(radius,2);
13    }
14
15    @Override
16    public double calculatePerimeter() {
17        return 2 * Math.PI * radius;
18    }
19
20    @Override
21    public void GetInfosAboutShape() {
22        System.out.println("Shape : "+this.getClass().getName().replace("com.company.InheritanceProblem.", ""));
23        System.out.println("Area : "+calculateArea());
24        System.out.println("Perimeter : "+calculatePerimeter());
25    }
26 }
27
```

```
1 package com.company.InheritanceProblem;
2
3 public class Cylinder extends ThreeDimensionShape{
4
5     private double radius;
6     private double height;
7
8     public Cylinder(double radius, double height){
9         this.radius = radius;
10        this.height = height;
11    }
12
13    @Override
14    public void GetInfosAboutShape() {
15        System.out.println("Shape : "+this.getClass().getName().replace("com.company.InheritanceProblem.", ""));
16        System.out.println("Volume : "+calculateVolume());
17        System.out.println("Area : "+calculateArea());
18        System.out.println("Perimeter : "+calculatePerimeter());
19    }
20
21    @Override
22    public double calculateVolume() {
23        return Math.PI * Math.pow(radius,2) * height;
24    }
25
26    @Override
27    public double calculateArea() {
28        return 2 * Math.PI * radius * (radius+height);
29    }
30
31    @Override
32    public double calculatePerimeter() {
33        return (8 * Math.PI * radius) + (2 * height);
34    }
35 }
36
```

```
1 package com.company;
2
3 import com.company.InheritanceProblem.*;
4
5 public class Main {
6
7     public static void main(String[] args) {
8         Square square1 = new Square(5);
9         Rectangle rectangle1 = new Rectangle(3,4);
10        Circle circle1 = new Circle(5);
11        Cube cube1 = new Cube(7);
12        Cylinder cylinder1 = new Cylinder(2,4);
13        Prism prism1 = new Prism(2,3,4);
14
15        square1.GetInfosAboutShape();
16        System.out.println();
17
18        rectangle1.GetInfosAboutShape();
19        System.out.println();
20
21        circle1.GetInfosAboutShape();
22        System.out.println();
23
24        cube1.GetInfosAboutShape();
25        System.out.println();
26
27        cylinder1.GetInfosAboutShape();
28        System.out.println();
29
30        prism1.GetInfosAboutShape();
31        System.out.println();
32    }
33
34
35 }
36
```

```
1 C:\Users\sahin\.jdk\openjdk-17\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2021.2.2\lib\
  idea_rt.jar=51959:C:\Program Files\JetBrains\IntelliJ IDEA 2021.2.2\bin" -Dfile.encoding=UTF-8 -classpath C:\
  Users\sahin\Desktop\BachelorDegree\SecondYear\ObjectOrientedProgramming\Week6\202000PMidtermExam\out\production
  \202000PMidtermExam com.company.Main
2 Shape : Square
3 Area : 25.0
4 Perimeter : 20.0
5
6 Shape : Rectangle
7 Area : 12.0
8 Perimeter : 14.0
9
10 Shape : Circle
11 Area : 78.53981633974483
12 Perimeter : 31.41592653589793
13
14 Shape : Cube
15 Volume : 343.0
16 Area : 294.0
17 Perimeter : 28812.0
18
19 Shape : Cylinder
20 Volume : 50.26548245743669
21 Area : 75.39822368615503
22 Perimeter : 58.26548245743669
23
24 Shape : Prism
25 Volume : 24.0
26 Area : 52.0
27 Perimeter : 72.0
28
29
30 Process finished with exit code 0
31
```