

Rajalakshmi Engineering College

Name: Harish V.H
Email: 240701175@rajalakshmi.edu.in
Roll no: 240701175
Phone: 9080255347
Branch: REC
Department: CSE - Section 2
Batch: 2028
Degree: B.E - CSE

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 6_Q4

Attempt : 1

Total Mark : 10

Marks Obtained : 0

Section 1 : Coding

1. Problem Statement

Mr.Kapoor wants to create a program to calculate the volume of a Cuboid and a Cube using method overriding.

Implements a base class Cuboid with attributes for length, width, and height. Include a method calculateVolume() that computes the volume of the cuboid.

Extends the base class with a subclass Cube representing a cube, where all sides are equal. Override the calculateVolume() method in the Cube class to compute the volume of the cube.

The program should take user input for the dimensions of the cuboid and the side length of the cube and display the calculated volumes with two decimal places.

Input Format

The first line of input consists of 3 space-separated double values, representing the cuboid length, width, and height, respectively.

The second line consists of a double value, representing the side length of the cube.

Output Format

The first line of output prints the volume of the cuboid, rounded off to two decimal places.

The second line prints the volume of the cube, rounded off to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 60.0 60.0 60.0
50.0

Output: Volume of Cuboid: 216000.00
Volume of Cube: 125000.00

Answer

```
import java.util.Scanner;  
// You are using Java  
import java.util.Scanner;  
  
// Base class: Cuboid  
class Cuboid {  
    protected double length;  
    protected double width;  
    protected double height;  
  
    public Cuboid(double length, double width, double height) {  
        this.length = length;  
        this.width = width;  
        this.height = height;
```

```
}

public double calculateVolume() {
    return length * width * height;
}
}

// Subclass: Cube
class Cube extends Cuboid {

    public Cube(double side) {
        super(side, side, side); // All sides are equal in a cube
    }

    @Override
    public double calculateVolume() {
        return length * length * length;
    }
}

// Main class
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Read cuboid dimensions
        double length = sc.nextDouble();
        double width = sc.nextDouble();
        double height = sc.nextDouble();

        // Read cube side length
        double side = sc.nextDouble();

        // Create objects
        Cuboid cuboid = new Cuboid(length, width, height);
        Cube cube = new Cube(side);

        // Calculate and print volumes
        System.out.printf("Volume of Cuboid: %.2f\n", cuboid.calculateVolume());
        System.out.printf("Volume of Cube: %.2f\n", cube.calculateVolume());
    }
}
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        double cuboidLength = scanner.nextDouble();  
        double cuboidWidth = scanner.nextDouble();  
        double cuboidHeight = scanner.nextDouble();  
  
        // Regular object instantiation for Cuboid  
        Cuboid cuboid = new Cuboid(cuboidLength, cuboidWidth, cuboidHeight);  
        System.out.printf("Volume of Cuboid: %.2f\n", cuboid.calculateVolume());  
  
        double cubeSide = scanner.nextDouble();  
  
        // Upcasting - Using superclass reference for subclass object (DMD)  
        Cuboid cube = new Cube(cubeSide); // Upcasting  
        System.out.printf("Volume of Cube: %.2f", cube.calculateVolume()); // Calls  
        Cube's method dynamically  
  
        scanner.close();  
    }  
}
```

Status : Wrong

Marks : 0/10