Java Week 3: Q3

A class Shape is defined with two overloading constructors in it. Another class Test1 is partially defined which inherits the class Shape. The class Test1 should include two overloading constructors as appropriate for some object instantiation shown in main( ) method. You should define the constructors using the super class constructors. Also, override the method calculate( ) in Test1 to calculate the volume of a Shape.

Sample Test Cases

<table>
<thead>
<tr>
<th>Test Case 1</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0 1.0 1.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Case 2</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0 1.0 1.0</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Case 3</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0 3.0 4.0</td>
<td>16.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.0</td>
</tr>
</tbody>
</table>

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Sample solutions (Provided by instructor)

```java
import java.util.Scanner;

class Shape{
    double length, breadth;
    Shape(double l, double b){ //Constructor to initialize a Shape object
        length = l;
        breadth= b;
    }
    Shape(double len){ //Constructor to initialize another Shape object
        length = breadth = len;
    }
    double calculate(){ // To calculate the area of a shape object
        return length * breadth;
    }
}
```
public class Test1 extends Shape{
    double height;
    Test1(double length, double h) {
        super(length);
        height = h;
    }
    Test1(double length, double breadth, double h) {
        super(length, breadth);
        height = h;
    }
    double calculate() {
        // calculate the volume of the shape
        return length * breadth * height;
    }
}

public static void main(String args[]){
    Scanner sc = new Scanner(System.in); //Create an object to read input
    double l = sc.nextDouble(); //Read length
    double b = sc.nextDouble(); //Read breadth
    double h = sc.nextDouble(); //Read height
    Test1 myshape1 = new Test1(l, h);
    Test1 myshape2 = new Test1(l, b, h);
    double volume1=
    double volume2;
    volume1 = myshape1.calculate();
    volume2 = myshape2.calculate();
    System.out.println(volume1);
    System.out.println(volume2);
}
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