Status	Finished
Started	Monday, 4 November 2024, 6:45 PM
Completed	Monday, 4 November 2024, 6:56 PM
Duration	11 mins 45 secs

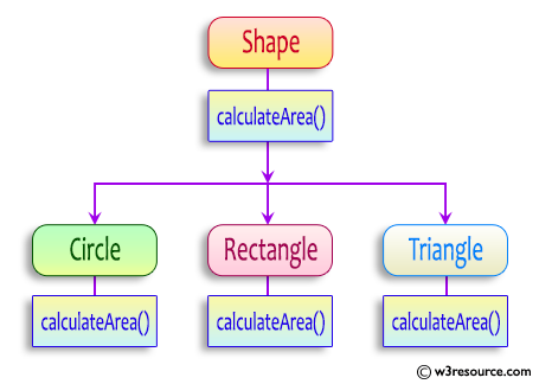
Question **1**

Correct

Marked out of 5.00

Create a base class Shape with a method called calculateArea(). Create three subclasses: Circle, Rectangle, and Triangle. Override the calculateArea() method in each subclass to calculate and return the shape's area.

In the given exercise, here is a simple diagram illustrating polymorphism implementation:




```
 abstract class Shape {
    public abstract double calculateArea() ;
    }
}
```

System.out.printf("Area of a Triangle :%.2f%n",((0.5)*base*height)); // use this statement

sample Input :

4 // radius of the circle to calculate area PI*r*r

5 // length of the rectangle

6 // breadth of the rectangle to calculate the area of a rectangle

4 // base of the triangle

3 // height of the triangle

OUTPUT:

Area of a circle :50.27
Area of a Rectangle :30.00
Area of a Triangle :6.00

For example:

Test	Input	Result
1	4 5 6 4 3	Area of a circle: 50.27 Area of a Rectangle: 30.00 Area of a Triangle: 6.00
2	7 4.5 6.5 2.4 3.6	Area of a circle: 153.94 Area of a Rectangle: 29.25 Area of a Triangle: 4.32

Answer: (penalty regime: 0 %)

```
17      }
18  }
19
20  class Rectangle extends Shape {
21      private double length;
22      private double breadth;
23
24      public Rectangle(double length, double breadth) {
25          this.length = length;
26          this.breadth = breadth;
27      }
28
```

```
    @Override
    public double calculateArea() {
        return length * breadth;
    }
}

class Triangle extends Shape {
    private double base;
    private double height;

    public Triangle(double base, double height) {
        this.base = base;
        this.height = height;
    }

    @Override
    public double calculateArea() {
        return 0.5 * base * height;
    }
}

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

        double radius = scanner.nextDouble();
        Circle circle = new Circle(radius);
        System.out.printf("Area of a circle: %.2f%n", circle.calculateArea());

        double length = scanner.nextDouble();
        double breadth = scanner.nextDouble();
        Rectangle rectangle = new Rectangle(length, breadth);
        System.out.printf("Area of a Rectangle: %.2f%n", rectangle.calculateArea());

        double base = scanner.nextDouble();
        double height = scanner.nextDouble();
        Triangle triangle = new Triangle(base, height);
        System.out.printf("Area of a Triangle: %.2f%n", triangle.calculateArea());
    }
}
```

	Test	Input	Expected	Got	
✓	1	4 5 6 4 3	Area of a circle: 50.27 Area of a Rectangle: 30.00 Area of a Triangle: 6.00	Area of a circle: 50.27 Area of a Rectangle: 30.00 Area of a Triangle: 6.00	✓
✓	2	7 4.5 6.5 2.4 3.6	Area of a circle: 153.94 Area of a Rectangle: 29.25 Area of a Triangle: 4.32	Area of a circle: 153.94 Area of a Rectangle: 29.25 Area of a Triangle: 4.32	✓

Passed all tests! ✓

Question **2**

Correct

Marked out of 5.00

1. Final Variable:

- Once a variable is declared `final`, its value cannot be changed after it is initialized.
- It must be initialized when it is declared or in the constructor if it's not initialized at declaration.
- It can be used to define constants

```
final int MAX_SPEED = 120;  // Constant value, cannot be changed
```

2. Final Method:

- A method declared `final` cannot be overridden by subclasses.
- It is used to prevent modification of the method's behavior in derived classes.

```
public final void display() {
    System.out.println("This is a final method.");
}
```

3. Final Class:

- A class declared as `final` cannot be subclassed (i.e., no other class can inherit from it).
- It is used to prevent a class from being extended and modified.
- public final class Vehicle {
  // class code
  }

Given a Java Program that contains the bug in it, your task is to clear the bug to the output.

you should delete any piece of code.

For example:

Test	Result
1	The maximum speed is: 120 km/h This is a subclass of FinalExample.

Answer: (penalty regime: 0 %)

Reset answer

```
class FinalExample {

    int maxSpeed = 120;

    public final void displayMaxSpeed() {
        System.out.println("The maximum speed is: " + maxSpeed + " km/h");
    }
}

class SubClass extends FinalExample {




    public void showDetails() {
        System.out.println("This is a subclass of FinalExample.");
    }
}

class prog {
    public static void main(String[] args) {
        FinalExample obj = new FinalExample();
        obj.displayMaxSpeed();

        SubClass subObj = new SubClass();
        subObj.showDetails();
    }
}

```

	Test	Expected	Got	
✓	1	The maximum speed is: 120 km/h This is a subclass of FinalExample.	The maximum speed is: 120 km/h This is a subclass of FinalExample.	✓

Passed all tests! ✓

Question **3**

Correct

Marked out of 5.00

As a logic building learner you are given the task to extract the string which has vowel as the first and last characters from the given array of Strings.

Step1: Scan through the array of Strings, extract the Strings with first and last characters as vowels; these strings should be concatenated.

Step2: Convert the concatenated string to lowercase and return it.

If none of the strings in the array has first and last character as vowel, then return no matches found

input1: an integer representing the number of elements in the array.

input2: String array.

Example 1:

input1: 3

input2: {“oreo”, “sirish”, “apple”}

output: oreoapple

Example 2:

input1: 2

input2: {“Mango”, “banana”}

output: no matches found

Explanation:

None of the strings has first and last character as vowel.

Hence the output is no matches found.

Example 3:

input1: 3

input2: {“Ate”, “Ace”, “Girl”}

output: ateace

For example:

Input	Result
3 oreo sirish apple	oreoapple
2 Mango banana	no matches found
3 Ate Ace Girl	ateace

Answer: (penalty regime: 0 %)

```
import java.util.Scanner;

public class VowelStringExtractor {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Step 1: Read the number of elements in the array
        int n = scanner.nextInt();

        // Step 2: Read the array of strings
        String[] inputArray = new String[n];
        for (int i = 0; i < n; i++) {
            inputArray[i] = scanner.next();
        }

        // Step 3: Extract strings with vowels as first and last characters
        String result = extractVowelStrings(inputArray);
```

```
        String result = extractVowelStrings(inputArray);

        // Step 4: Print the result
        System.out.println(result);
    }

    private static String extractVowelStrings(String[] strings) {
        StringBuilder concatenated = new StringBuilder();

        for (String str : strings) {
            if (isVowel(str.charAt(0)) && isVowel(str.charAt(str.length() - 1))) {
                concatenated.append(str);
            }
        }

        // Step 5: Return the result
        return concatenated.length() > 0 ? concatenated.toString().toLowerCase() : "no matches
    }

    private static boolean isVowel(char ch) {
        ch = Character.toLowerCase(ch); // Convert to lowercase for comparison
        return ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u';
    }
}
```

	Input	Expected	Got	
✓	3 oreo sirish apple	oreoapple	oreoapple	✓
✓	2 Mango banana	no matches found	no matches found	✓
✓	3 Ate Ace Girl	ateace	ateace	✓

Passed all tests! ✓

◄ Lab-08-MCQ

Jump to...

FindStringCode ►