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Status	Finished
Started	Monday, 14 October 2024, 9:43 PM
Completed	Monday, 14 October 2024, 10:09 PM
Duration	26 mins 7 secs

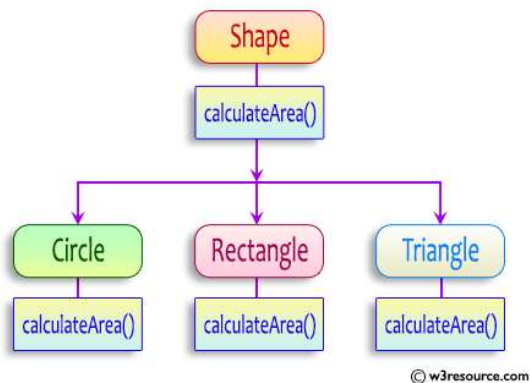
Question 1

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 %)

```

1 import java.util.Scanner;
2
3 // Abstract class Shape
4 abstract class Shape {

```

```

5     public abstract double calculateArea();
6 }
7
8 // Circle class
9 class Circle extends Shape {
10     private double radius;
11
12     public Circle(double radius) {
13         this.radius = radius;
14     }
15
16     @Override
17     public double calculateArea() {
18         return Math.PI * radius * radius; // Area of circle:  $\pi r^2$ 
19     }
20 }
21
22 // Rectangle class
23 class Rectangle extends Shape {
24     private double length;
25     private double breadth;
26
27     public Rectangle(double length, double breadth) {
28         this.length = length;
29         this.breadth = breadth;
30     }
31
32     @Override
33     public double calculateArea() {
34         return length * breadth; // Area of rectangle: length * breadth
35     }
36 }
37
38 // Triangle class
39 class Triangle extends Shape {
40     private double base;
41     private double height;
42
43     public Triangle(double base, double height) {
44         this.base = base;
45         this.height = height;
46     }
47
48     @Override
49     public double calculateArea() {
50         return 0.5 * base * height; // Area of triangle:  $0.5 * \text{base} * \text{height}$ 
51     }
52 }

```

	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

```
1 class FinalExample {
2
3     // Final variable
4     final int maxSpeed = 120;
5
6     // Final method
7     public final void displayMaxSpeed() {
8         System.out.println("The maximum speed is: " + maxSpeed + " km/h");
9     }
10 }
11
12 class SubClass extends FinalExample {
13
14     // You can create new methods here
15     public void showDetails() {
16         System.out.println("This is a subclass of FinalExample.");
17     }
18 }
19
20 class prog {
21     public static void main(String[] args) {
22         FinalExample obj = new FinalExample();
23         obj.displayMaxSpeed();
24     }
25 }
```

```
24  
25         SubClass subObj = new SubClass();  
26         subObj.showDetails();  
27     }  
28 }  
29
```

	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 %)

```

1 import java.util.Scanner;
2
3 public class VowelStringExtractor {
4
5     // Method to extract strings with vowels as first and last characters
6     public static String extractVowelStrings(String[] stringArray) {
7         StringBuilder result = new StringBuilder();
8         String vowels = "aeiouAEIOU"; // String containing all vowels
9
10        // Iterate through the array of strings

```

```

11  for (String s : stringArray) {
12      // Check if the string is not empty and if both the first and last characters are vowels
13      if (s.length() > 0 && vowels.indexOf(s.charAt(0)) != -1 && vowels.indexOf(s.charAt(s.length() - 1)) != -1)
14          result.append(s); // Append matching string to the result
15      }
16  }
17
18  // Return the concatenated string in lowercase or "no matches found"
19  return result.length() > 0 ? result.toString().toLowerCase() : "no matches found";
20  }
21
22  public static void main(String[] args) {
23      Scanner scanner = new Scanner(System.in);
24
25      // Input for the number of strings
26
27      int n = scanner.nextInt();
28      scanner.nextLine(); // Consume the newline character
29
30      // Input for the strings in one line
31
32      String input = scanner.nextLine();
33      String[] strings = input.split(" "); // Split input into an array
34
35      // Process and output the result
36      String result = extractVowelStrings(strings);
37      System.out.println(result);
38
39      scanner.close(); // Close the scanner
40  }
41  }
42

```

	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 ▶