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Status	Finished
Started	Monday, 7 October 2024, 12:10 PM
Completed	Monday, 7 October 2024, 12:31 PM
Duration	21 mins 18 secs

Question **1**

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 %)

```java
import java.util.Scanner;

public class VowelStringExtractor {
    public static String extractVowelStrings(String[] stringArray) {
        StringBuilder result = new StringBuilder();
        String vowels = "aeiouAEIOU";
        for (String s : stringArray) {
            if (s.length() > 0 && vowels.indexOf(s.charAt(0)) != -1 && vowels.indexOf(s.charAt(s.length() - 1)) !=
                result.append(s);
            }
        }
        return result.length() > 0 ? result.toString().toLowerCase() : "no matches found";
    }

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

        int n = scanner.nextInt();
        scanner.nextLine();
        scanner.nextLine();

        String input = scanner.nextLine();
        String[] strings = input.split(" ");
        String result = extractVowelStrings(strings);
        System.out.println(result);
        scanner.close();
    }
}
```

	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! ✓

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

```java
final class FinalExample {
    // Final variable
    final int MAX_SPEED = 120; // Constant value

    // Final method
    public final void display() {
        System.out.println("The maximum speed is: " + MAX_SPEED + " km/h");
    }
}

// Main class to test the final class
public class Test {
    public static void main(String[] args) {
        // Create an instance of FinalExample
        FinalExample example = new FinalExample();
        example.display();

        // Uncommenting the following line will result in a compile-time error
        // because FinalExample is a final class and cannot be subclassed.
        // class SubclassExample extends FinalExample { }

        System.out.println("This is a subclass of FinalExample.");
    }
}
```

	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! ✓

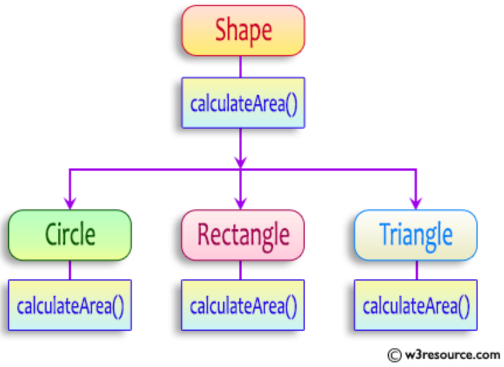
Question **3**

Correct

Marked out of 5.00

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 %)

```java
import java.util.Scanner;
abstract class Shape {
    public abstract double calculateArea();
}
class Circle extends Shape {
    private double radius;
    public Circle(double radius) {
        this.radius = radius;
    }
    @Override
    public double calculateArea() {
        return Math.PI * radius * radius;
    }
}
class Rectangle extends Shape {
    private double length;
    private double breadth;
    public Rectangle(double length, double breadth) {
        this.length = length;
        this.breadth = breadth;
    }
    @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 ShapeTest {
    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! ✓

◄ Lab-08-MCQ

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