Dashboard / My courses / CS23333-OOPUJ-2023 / Lab-08 - Polymorphism, Abstract Classes, final Keyword / Lab-08-Logic Building

Status	Finished
Started	Thursday, 17 October 2024, 6:31 PM
Completed	Thursday, 17 October 2024, 7:10 PM
Duration	39 mins 4 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 %)

```
import java.io.*;
import java.util.*;

public class vowel {
    public static void main(String args[]) {
        Scanner ss = new Scanner(System.in);
        int n = ss.nextInt();
        String[] a = new String[n];
        for (int i = 0; i < n; i++) {
            a[i] = ss.next().toLowerCase();
        }
        StringBuffer sb = new StringBuffer();
        for (int i = 0; i < n; i++) {
            String s = a[i];
            int l = s.length();
            if (s.charAt(0) == 'a' || s.charAt(0) == 'e' || s.charAt(0) == 'i' || s.charAt(0) == 'o' || s.charAt(0) == 'u') {
                if (s.charAt(l - 1) == 'a' || s.charAt(l - 1) == 'e' || s.charAt(l - 1) == 'i' || s.charAt(l - 1) == 'o' || s.ch
                    sb.append(s);
                }
            }
        }
        if (sb.isEmpty()) {
            System.out.println("no matches found");
        } else {
            System.out.println(sb);
        }
    }
}
```

	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! ✓

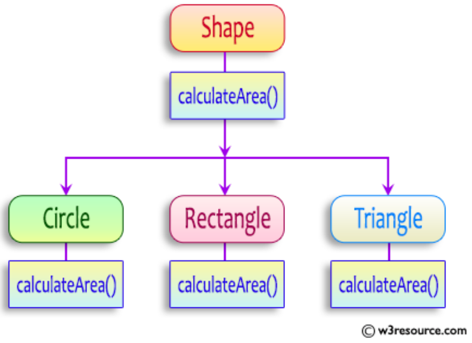
Question **2**

Correct

Marked out of 5.00

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 %)

```
import java.util.*;

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

class Circle extends Shape {
    double radius;

    Circle(double r) {
        radius = r;
    }
    public double calculateArea() {
        return radius * radius * Math.PI;
    }
}

class Rectangle extends Shape {
    double length;
    double breadth;

    Rectangle(double l, double b) {
        length = l;
        breadth = b;
    }

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

class Triangle extends Shape {
    double base;
    double height;

    Triangle(double b, double h) {
        base = b;
        height = h;
    }

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

public class Main {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        double radius = s.nextDouble();
        double length = s.nextDouble();
        double breadth = s.nextDouble();
```

	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 **3**

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

```
final class FinalExample {
    final int maxSpeed = 120;

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

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

◄ Lab-08-MCQ

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