| | |
|---|---|
| **Status** | Finished |
| **Started** | Thursday, 10 October 2024, 12:02 PM |
| **Completed** | Sunday, 13 October 2024, 12:24 PM |
| **Duration** | 3 days |

Question **1**

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<br>This is a subclass of FinalExample. |

**Answer:** (penalty regime: 0 %)

Reset answer

```
class FinalExample {

    // Final variable
                final int maxSpeed = 120;

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

class SubClass extends FinalExample {



    // You can create new methods here
    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<br>This is a subclass of FinalExample. | The maximum speed is: 120 km/h<br>This is a subclass of FinalExample. | ✓ |

Passed all tests! ✓

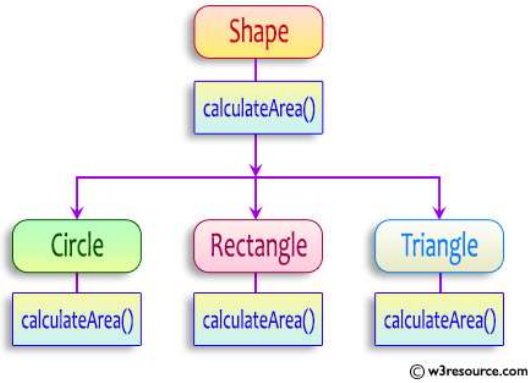
Question **2**

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<br>5<br>6<br>4<br>3 | Area of a circle: 50.27<br>Area of a Rectangle: 30.00<br>Area of a Triangle: 6.00 |
| 2 | 7<br>4.5<br>6.5<br>2.4<br>3.6 | Area of a circle: 153.94<br>Area of a Rectangle: 29.25<br>Area of a Triangle: 4.32 |

**Answer:** (penalty regime: 0 %)

```
1 import java.util.Scanner;
2 abstract class Shape {
3     public abstract double calculateArea();
4 }
```

```
class Circle extends Shape {
     private double radius;

     public Circle(double radius) {
        this.radius = radius;
    }

    public double calculateArea() {
        return 3.14157 * radius * radius;
    }
}
class Rectangle extends Shape {
     private double length;
     private double width;

    public Rectangle(double length, double width) {
        this.length = length;
        this.width = width;
    }


    public double calculateArea() {
        return length * width;
    }
}
class Triangle extends Shape {
     private double base;
     private double height;

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


    public double calculateArea() {
        return 0.5 * base * height;
    }
}
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        double r = sc.nextDouble();
        Circle circle = new Circle(r);

        double length = sc.nextDouble();
        double width = sc.nextDouble();
        Rectangle rectangle = new Rectangle(length, width);
```

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

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<br>oreo sirish apple | oreoapple |
| 2<br>Mango banana | no matches found |
| 3<br>Ate Ace Girl | ateace |

**Answer:** (penalty regime: 0 %)

```
import java.util.Scanner;
public class VowelStringExtractor {

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();

        String input = sc.nextLine();
        String[] words = input.split(" ");
```

```
11
12          StringBuilder result = new StringBuilder();
13          String vowels = "aeiouAEIOU";
14
15          for (String word : words) {
16              if (word.length() > 0 && vowels.indexOf(word.charAt(0)) != -1 && vowels.indexOf(word.charAt(word.leng
17                  result.append(word);
18              }
19          }
20
21          if (result.length() > 0) {
22              System.out.println(result.toString().toLowerCase());
23          } else {
24              System.out.println("no matches found");
25          }
26
27      }
28  }
```

| | Input | Expected | Got | |
|---|---|---|---|---|
| ✓ | 3<br>oreo sirish apple | oreoapple | oreoapple | ✓ |
| ✓ | 2<br>Mango banana | no matches found | no matches found | ✓ |
| ✓ | 3<br>Ate Ace Girl | ateace | ateace | ✓ |

Passed all tests! ✓

◄ Lab-08-MCQ

Jump to...

FindStringCode ►