Triangle Area Calculator Documentation

Overview

This Java program calculates the area of a triangle based on user-provided input values for the base and height. It includes input validation, error handling, and an option for multiple calculations through a loop.

Features

- Prompts the user to enter the base and height of a triangle.
- Validates that the inputs are positive numbers.
- Calculates the area using the formula:

area=base×height2\text{area} = \frac{\text{base} \times \text{height}}{2}

- Displays the calculated area.
- Allows the user to perform multiple calculations by prompting whether they want to continue.
- Includes error handling for invalid inputs.

Code Breakdown

1. Package Declaration

package Calculo_;

This places the class within the Calculo_ package for organization.

2. Import Statement

import java.util.Scanner;

Imports the Scanner class to read user input from the console.

3. Class Declaration

public class CalcularArea {

Defines the CalcularArea class that contains the main method.

4. Scanner Initialization

Scanner console = new Scanner(System.in);

Creates a Scanner object to receive user input.

5. Variable Declarations

double base, height;

double area;

Declares variables to store the base, height, and calculated area of the triangle.

6. User Input Handling

System.out.print("Enter the base of the triangle: ");

base = console.nextDouble();

console.nextLine(); // Clear the buffer

System.out.print("Enter the height of the triangle: ");

height = console.nextDouble();

console.nextLine(); // Clear the buffer

Prompts the user for the base and height values, reads the inputs, and clears the buffer.

7. Input Validation

if (base <= 0 || height <= 0) {

  System.out.println("Error: Base and height must be positive numbers.");

}

Checks if the user entered a non-positive number and displays an error message if necessary.

8. Area Calculation

else {

  area = (base * height) / 2;

  System.out.println("The area of the triangle is: " + area);

}

If inputs are valid, calculates and displays the area.

9. Loop for Multiple Calculations

```
boolean continueCalculation = true;

while (continueCalculation) {
```

A while loop allows the user to perform multiple calculations.

10. User Prompt for Recalculation

```
System.out.print("Do you want to calculate another area? (yes/no): ");

String response = console.nextLine().toLowerCase();
```

Prompts the user to continue or exit the program.

11. Handling User Responses

```
if (response.equals("no")) {
   continueCalculation = false;
   System.out.println("Thank you for using the Triangle Area Calculator!");
} else if (response.equals("yes")) {
```

Processes user input to decide whether to perform another calculation or exit.

12. Error Handling for Invalid Input

```
} else {
   System.out.println("Invalid input. Please enter 'yes' or 'no'.");
}
```

Ensures that the user provides a valid response.

13. Closing the Scanner

```
console.close();
```

Closes the Scanner object to prevent resource leaks.

Usage Instructions

1. Run the program in a Java environment.
2. Enter the base and height when prompted.
3. View the calculated area.
4. Decide whether to perform another calculation.

5. Exit the program when done.

Example Output

Enter the base of the triangle: 5

Enter the height of the triangle: 10

The area of the triangle is: 25.0

Do you want to calculate another area? (yes/no): yes

Enter the base of the triangle: -3

Error: Base and height must be positive numbers.

Do you want to calculate another area? (yes/no): no

Thank you for using the Triangle Area Calculator!

Conclusion

This program demonstrates basic Java programming concepts, including user input handling, conditionals, loops, and error handling. It provides an interactive way for users to calculate triangle areas with input validation and multiple attempts.