K.R. Mangalam University

School of Engineering & Technology

Fundamentals Of Java Programming

Assignment 2

Calculator Application Using Method Overloading

Submitted by:

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Course: BCA (AI & DS)

Section: B

CODE:

```java
// Assignment 02: Calculator Application Using Method Overloading
// Submitted by: Khushi Dahiya
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// Course: BCA (AI & DS)

import java.util.Scanner;

class Calculator {

    // Method Overloading for Addition
    int add(int a, int b) {
        return a + b;
    }

    double add(double a, double b) {
        return a + b;
    }

    int add(int a, int b, int c) {
        return a + b + c;
    }

    // Subtraction
    int subtract(int a, int b) {
        return a - b;
    }

    // Multiplication
    double multiply(double a, double b) {
        return a * b;
    }

```

```java
    // Division (with divide-by-zero handling)
    double divide(int a, int b) {
        try {
            if (b == 0) {
                throw new ArithmeticException(s: "Division by zero is not allowed.");
            }
            return (double) a / b;
        } catch (ArithmeticException e) {
            System.out.println("Error: " + e.getMessage());
            return 0;
        }
    }
}

public class JavaAssignment2 {

    Scanner sc = new Scanner(System.in);
    Calculator calc = new Calculator();

    void performAddition() {
        System.out.print(s: "\nEnter first number: ");
        double a = sc.nextDouble();
        System.out.print(s: "Enter second number: ");
        double b = sc.nextDouble();
        System.out.println("Result: " + calc.add(a, b));
    }

    void performSubtraction() {
        System.out.print(s: "\nEnter first integer: ");
        int a = sc.nextInt();
```

```
        System.out.print("Enter second integer: ");
        int b = sc.nextInt();
        System.out.println("Result: " + calc.subtract(a, b));
    }

    void performMultiplication() {
        System.out.print("\nEnter first number: ");
        double a = sc.nextDouble();
        System.out.print("Enter second number: ");
        double b = sc.nextDouble();
        System.out.println("Result: " + calc.multiply(a, b));
    }

    void performDivision() {
        System.out.print("\nEnter dividend (int): ");
        int a = sc.nextInt();
        System.out.print("Enter divisor (int): ");
        int b = sc.nextInt();
        double result = calc.divide(a, b);
        System.out.println("Result: " + result);
    }

    void mainMenu() {
        int choice;
        do {
            System.out.println("\n==== Welcome to the Calculator Application ====");
            System.out.println("1. Add Numbers");
            System.out.println("2. Subtract Numbers");
            System.out.println("3. Multiply Numbers");
            System.out.println("5. Exit");
            System.out.print("Enter your choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1:
                    performAddition();
                    break;
                case 2:
                    performSubtraction();
                    break;
                case 3:
                    performMultiplication();
                    break;
                case 4:
                    performDivision();
                    break;
                case 5:
                    System.out.println("Thank you for using the Calculator. Goodbye!");
                    break;
                default:
                    System.out.println("Invalid option. Please try again!");
            }
        } while (choice != 5);
    }

```

```
    Run | Debug
119     public static void main(String[] args) {
120         JavaAssignment2 ui = new JavaAssignment2();
121         ui.mainMenu();
122     }
123 }
124
```

OUTPUT:

```
=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 1

Enter first number: 5
Enter second number: 5
Result: 10.0

=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 2

Enter first integer: 3
Enter second integer: 2
Result: 1

=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 3

Enter first number: 2
Enter second number: 3
```

```
=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 3

Enter first number: 2
Enter second number: 3
Result: 6.0

=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 4

Enter dividend (int): 4
Enter divisor (int): 0
Error: Division by zero is not allowed.
Result: 0.0

=== Welcome to the Calculator Application ===
1. Add Numbers
2. Subtract Numbers
3. Multiply Numbers
4. Divide Numbers
5. Exit
Enter your choice: 5
Thank you for using the Calculator. Goodbye!
```