



## Java Programming

### Project Idea: Simple Calculator using JavaFX

#### AIM:

To develop a user-friendly **calculator application** using **JavaFX** that allows users to perform basic arithmetic operations efficiently. The calculator should have an intuitive graphical interface, supporting real-time calculations, error handling, and responsive design for ease of use.

#### Key Focus Areas:

- Designing a user-friendly and visually appealing JavaFX interface.
- Implementing core arithmetic operations with high accuracy.
- Ensuring error-free calculations and optimized performance.
- Providing a seamless experience with both mouse and keyboard input support.

#### Objectives:

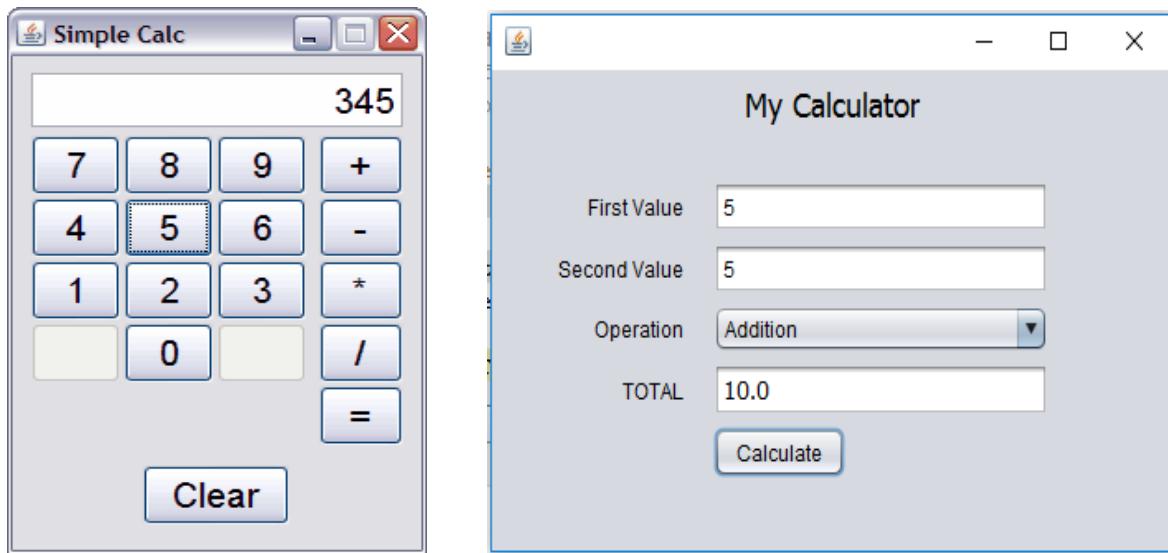
- **User Interface Design:**
  - Develop a clean and responsive GUI using JavaFX.
  - Implement buttons for numeric input and arithmetic operations.
  - Provide a text field to display input and results dynamically.
- **Functionality & Operations:**
  - Implement addition, subtraction, multiplication, and division.
  - Handle real-time input validation and error handling.
  - Ensure smooth computation with a clear button to reset the calculator.
- **Performance & Optimization:**
  - Optimize UI elements for quick response and seamless operation.
  - Implement keyboard input support for faster calculations.
  - Provide tooltips or hover effects for better usability.
- **Security & Accuracy:**
  - Prevent errors such as division by zero.
  - Ensure precise mathematical calculations with floating-point support.
  - Validate user inputs to avoid unexpected crashes.

#### Expected Output:

- A fully functional simple calculator with a graphical interface.
- Correct arithmetic calculations for all basic operations.
- Proper error handling for invalid inputs and zero-division cases.
- Responsive and smooth user experience.



### Sample Output:



### NOTE:

- The completed project must be uploaded to the student's own GitHub repository.
- The GitHub repository must be public for evaluation purposes.
- The repository link should be submitted via the Google Form:

<https://forms.gle/tNFMkX5wt343vpCo7>