# Basic Calculator Application Report

## Project Overview

The project is a basic calculator application built using Windows Forms in C#. The calculator supports basic arithmetic operations, square root calculation, modulo operation, and error handling. The application also supports horizontal scrolling to handle long expressions.

## Key Components

### txtDisplay (TextBox)

Purpose: This is the main display area for the calculator where the user inputs numbers and operations, and views the results.

Properties:

* Multiline: Set to false to ensure the TextBox is single-line.  
  ScrollBars: Set to Horizontal to enable horizontal scrolling for long expressions.

### Buttons

* Number buttons (button0 to button9): Used to input digits.  
  Operation buttons (bPlus, bDiv, bMutiplication, bSous, btModulo): Used to input arithmetic operations.  
  Function buttons (bEqual, bClear, btnClear1, bSqrt, bpoint): Used for equals, clear, backspace, square root, and decimal point functions.

## Event Handlers

### Number\_Click

Handles clicks on number buttons. Appends the clicked number to txtDisplay and moves the cursor to the end.

### Operation\_Click

Handles clicks on operation buttons. Appends the operation symbol to txtDisplay with spaces on both sides and moves the cursor to the end.

### btnPoint\_Click

Handles clicks on the decimal point button. Appends a decimal point to txtDisplay if it doesn't already end with one, and moves the cursor to the end.

### btnEquals\_Click

Handles clicks on the equals button. Evaluates the expression in txtDisplay using DataTable.Compute and displays the result. If an error occurs (e.g., invalid expression), it displays "Error!".

### btnClear\_Click

Clears the txtDisplay TextBox.

### btnSqrt\_Click

Calculates the square root of the current value in txtDisplay. Displays "Error!" if the value is invalid.

### btnBackspace\_Click

Deletes the last character in txtDisplay and moves the cursor to the end.

### txtDisplay\_TextChanged

Placeholder for handling text changed events in txtDisplay.

## Error Handling

The application uses try-catch blocks in btnEquals\_Click and btnSqrt\_Click to catch and handle any exceptions that may occur during calculation. If an exception is caught, "Error!" is displayed in txtDisplay.

## Design Considerations

* The application ensures that the cursor always moves to the end of the txtDisplay after any update, maintaining a smooth user experience.  
  Horizontal scrolling is enabled to handle long expressions without multiline input.  
  The use of DataTable.Compute simplifies the evaluation of arithmetic expressions, allowing the application to support complex calculations with minimal code.

## Conclusion

This basic calculator application demonstrates the use of Windows Forms for creating a user-friendly interface for arithmetic calculations. The implementation includes essential features such as error handling, support for multiple operations, and user input validation, making it a practical example for learning Windows Forms and C# programming.