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Technical Document

Calculator

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# Introduction

Technical Documentation outlining all features and variables of the calculator program, also including testing procedure and recommendations on upgrades and enhancements.

# Data Structures

Data Structure of Variables

|  |  |  |
| --- | --- | --- |
| Name | Type | Purpose |
| Total1 | Double | Variable to hold a double to use for calculations |
| Total2 | Double | Variable to hold a double to use for calculations |
| plusButtonClicked | Boolean | True of False variable to check if button is clicked |
| minusButtonClicked | Boolean | True of False variable to check if button is clicked |
| divideButtonClicked | Boolean | True of False variable to check if button is clicked |
| multiplyButtonClicked | Boolean | True of False variable to check if button is clicked |
| Num | Double | Used to hold and parse doubles from inputs |
| txtDisplay | TextBox | Used to enter and display numbers |

# Algorithms

Calculator Methods and Error Handling

**Button clicks 0 – 9**

IF (Button Clicked)

WRITE button text

END IF

**Button Clear**

IF(Button Clicked)

txtDisplay CLEAR

END IF

**Button Dot**

IF(Button Clicked)

WRITE “.”

END IF

**Button Addition**

IF(Button Clicked)

IF(Display !NullOREmpty)

Total1 += Display.Text

Display CLEAR()

PlusButton = True;

END IF

END IF

**Button Subtraction**

IF(Button Clicked)

IF(Display !NullOREmpty)

Total1 += Display.Text

Display CLEAR()

MinusButton = True;

END IF

END IF

**Button Division**

IF(Button Clicked)

IF(Display !NullOREmpty)

Total1 += Display.Text

Display CLEAR()

DivideButton = True;

END IF

END IF

**Button Multiplication**

IF(Button Clicked)

IF(Display !NullOREmpty)

Total1 += Display.Text

Display CLEAR()

MultiplyButton = True;

END IF

END IF

**Button Equals**

IF(Button Clicked)

IF(PlusButton TRUE)

Total 2 = total1 + display.text

ELSE IF (MinusButton TRUE)

Total 2 = total1 - display.text

ELSE IF (DivideButton TRUE)

Total 2 = total1 / display.text

ELSE IF (MultiplyButton TRUE)

Total 2 = total1 \* display.text

END IF

Display = total2

Total1 = 0

END IF

**Button SQRT**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = display.text

IF (Num >= 0)

Display = SquareRoot(Num)

ELSE

WRITE “ERROR”

Display = 0

END IF

END IF

END IF

**ToolStrip Item Quit**

IF(Button Clicked)

IF(WRITE “Message”, Response == OK)

Application CLOSE()

END IF

END IF

**ToolStrip Item Clear**

IF(Button Clicked)

Display CLEAR()

END IF

**Button Cube Root**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = Display.text

WRITE CubeRoot(Num)

END IF

END IF

**Button Inverse**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = Display.text

WRITE Inverse(Num)

END IF

END IF

**Button Tan**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = Display.text

IF(num == 90 || num == 270)

WRITE “UNDEFINED”

ELSE

Radians = num \* PI / 180

WRITE Tan(radians)

END IF

END IF

END IF

**Button Sin**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = Display.text

Radians = num \* PI / 180

WRITE Sin(Radians)

END IF

END IF

**Button Cosine**

IF(Button Clicked)

IF(Display !NullOREmpty)

Num = Display.text

Radians = num \* PI / 180

WRITE CubeRoot(Radians)

END IF

END IF

# Testing Procedure

Testing procedure of the calculator application is the run through each method multiple times using different inputs to ensure the correct functionality of the methods and ensure each method returns the correct results and is formatted correctly.

* Test Each Method using correct Inputs
* Test Each Method using Incorrect Inputs
* Error Check each Method

# Recommendations

Recommendations for future updates and enhancements

* More functionality by adding new buttons with mathematical formulas
* Options to change colours and size of button and application
* Enable the ability to change between a basic calculator and a scientific calculator

# GitHub

GitHub Repository for the calculator application including all source files and technical documentation.

<https://github.com/TrebliGM/Calculator>

