

# Technical Report

---

JUNE 27

---

GitHub Link:

<https://github.com/dushGitHub/Calculator.git>

Authored by: Dushanthi Hewa (P249400)



---

## Table of Contents

<b>Data Structures .....</b>	<b>3</b>
Name, type and purpose of each variable .....	3
<b>Algorithms .....</b>	<b>3</b>
Pseudo code for each method.....	3
Error handling techniques .....	7
<b>Recommended testing procedure .....</b>	<b>7</b>
<b>Recommendations on upgrades and future enhancement.....</b>	<b>9</b>
<b>GitHub .....</b>	<b>9</b>
Screen captures of creating a repository, making branches and merging them to the main branch:.....	9
<b>GitHub Public Access Link .....</b>	<b>11</b>
<a href="https://github.com/dushGitHub/Calculator.git">https://github.com/dushGitHub/Calculator.git</a> .....	11
<b>References.....</b>	<b>11</b>

---

# Data Structures

Name, type and purpose of each variable

Name	Type	Purpose
numTot	double	store the total value of calculation
nextNum	double	store the second value for the calculation
plusButtonClicked	boolean	make it true if the user clicked the plus button
minusButtonClicked	boolean	make it true if the user clicked the minus button
divideButtonClicked	boolean	make it true if the user clicked the divide button
multiplyButtonClicked	boolean	make it true if the user clicked the multiply button
TempNum	double	a temporary variable to store the text field value to check whether the value is zero
ch	char	store the keyboard entering character
lenDis	integer	Store the length of the display text
lenF	integer	Store the length of the formula label

## Algorithms

Pseudo code for each method

```
private void btnZero_Click()  
    Append the 0 to the text already in the text field  
    Append and display in the label  
private void btnOne_Click()  
    Append the 0 to the text already in the text field  
    Append and display in the label  
private void btnTwo_Click()  
    Append the 0 to the text already in the text field  
    Append and display in the label  
private void btnThree_Click()  
    Append the 0 to the text already in the text field  
    Append and display in the label
```

---

```
private void btnFour_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnFive_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnSix_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnSeven_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnEight_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnNine_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnTen_Click()
    Append the 0 to the text already in the text field
    Append and display in the label
private void btnDot_Click()
    check the text has a dot
    append the dot to the text if not
private void btnClear_Click()
    clear the text field and lable
    clear numTot, NextNum
    make the sate to false all the Boolean variables
private void txtDisplay_KeyPress()
    avoid entering other than numbers
    allow backspace and dot to work
private void btnEqual_Click()
    check each Boolean variable,
    if Add is true, do the addition
    if Minus is true, do the subtraction
    if Division is true, do the division
    if multiply is true, do the multiplication
    display the values in the text field
    clear formula label and numTot variable
```

---

```
private void btnPlus_Click()
    if the display text is not empty
        if the formula label is empty add the display text
        If the numTot is greater than 0, do the addition
        else put the text value to the numTot
    make plus boolean true and leave the rest false
    add the plus button caption to the formula label

private void btnMinus_Click()
    if the display text is not empty
        if the formula label is empty add the display text
        If the numTot is greater than 0, do the subtraction
        else put the text value to the numTot
    make Minus boolean true and leave the rest false
    add the Minus button caption to the formula label

private void btnDevision_Click()
    if the display text is not empty
        if the formula label is empty add the display text
        If the numTot is greater than 0, do the Devision
        else put the text value to the numTot
    make devision boolean true and leave the rest false
    add the Devision button caption to the formula label

private void btnMulti_Click()
    if the display text is not empty
        if the formula label is empty add the display text
        If the numTot is greater than 0, do the multiplication
        else put the text value to the numTot
    make Multi boolean true and leave the rest false
    add the Multi button caption to the formula label

private void btnSqrt_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        Check the value greater than or equal to 0
        If it is calculate square root not and error message
```

---

```
private void btnCubeRT_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        Check the value greater than or equal to 0
            If it is calculate square root not and error message

private void btnInv_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        Check the value equal to 0
            If it is so an error message, not calculate inverse

private void btnTan_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        If input is 90°, error message
        If input is 180 or 360, display 0 as the output
        Else, calculate tan value of the given number
    Make the numTot to 0

private void btnSin_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        Calculate Sine value of the given number
    Make the numTot to 0

private void btnCos_Click()
    If the display text is not empty
        Convert the text box value to double and pass it to the numTot variable
        If entered value is 90, display 0 as the output
        Else Calculate Cosine value of the given number
    Make the numTot to 0

private void btnPlusMinus_Click()
    Create a new variable called lengthOfdisplay, assign the length of display to it
    Create a new variable called length of formula and assign it to 0
    If the label formula is not empty, assign the length of formula label to it
    If the text display contain minus sign, remove it
    Else, add the minus sign
```

## Error handing techniques

1. Beginning of each method check the text field is not empty, before continue to do calculations
2. Check the label is empty or not when necessary
3. Check the input value for obvious incorrect input and throw an error message
4. At the end of each method make the input to 0
5. Always pass the textbox value as a double value to overcome runtime errors

## Recommended testing procedure

### How this software should be tested before commercial release

Software testing is a thorough examination conducted on the created software product to provide stakeholders with information about the quality of the software product. This testing techniques include the process of executing the program with the intent of finding errors or other defects and verifying that the software product is fit for use.

In the calculator project following testing techniques are been used;

1. meets the requirements that guided its design and development
2. responds correctly to usual inputs, shows in the test table
3. responds correctly to ambiguous inputs marked in red in following test table
4. performs its functions within an acceptable time
5. it is sufficiently usable

Test	Expected	Actual	Comment
Addition			
-5 + -5	-10	-10	Successful
-5 + 0	-5	-5	Successful
0 + 5	5	5	Successful
5 + 5	10	10	Successful
Subtraction			
-5 - -5	0	0	Successful
5 - 0	5	5	Successful
0 - 5	-5	-5	Successful
10 - 15	-5	-5	Successful
Multiplication			
5 * 5	10	10	Successful
5 * 0	0	0	Successful
0 * 5	0	0	Successful
5 * -5	-25	-25	Successful
Division			
10 / 5	2	2	Successful
10 / 3	3.33333	3.33333	Successful

10 / 0	Cannot divide by zero	Cannot divide by zero	Successful
0 / 10	0	0	Successful
10 / -2	-5	-5	Successful
Tan			
0°	0	0	Successful
30°	0.57735	.57735	Successful
45°	1	1	Successful
60°	1.73205	1.73205	Successful
90°	Invalid Value	Invalid input	Successful
Sin			
0°	0	0	Successful
30°	0.5	0.5	Successful
45°	0.70710	0.70710	Successful
60°	0.86602	0.86602	Successful
90°	1	1	Successful
Cos			
0°	1	1	Successful
30°	0.86602	0.86602	Successful
45°	0.70710	0.70710	Successful
60°	0.5	0.5	Successful
90°	0	0	Successful
Square Root			
0	0	0	Successful
1	1	1	Successful
2	1.41421	1.41421	Successful
-1	Invalid value	Invalid input	Successful
Cube Root			
0	0	0	Successful
1	1	1	Successful
2	1.259921	1.259921	Successful
-1	Invalid input	Invalid input	Successful
Inverse			
0	Math Error	Invalid input	Successful
1	1	1	Successful
2	0.5	0.5	Successful
-1	-1	-1	Successful

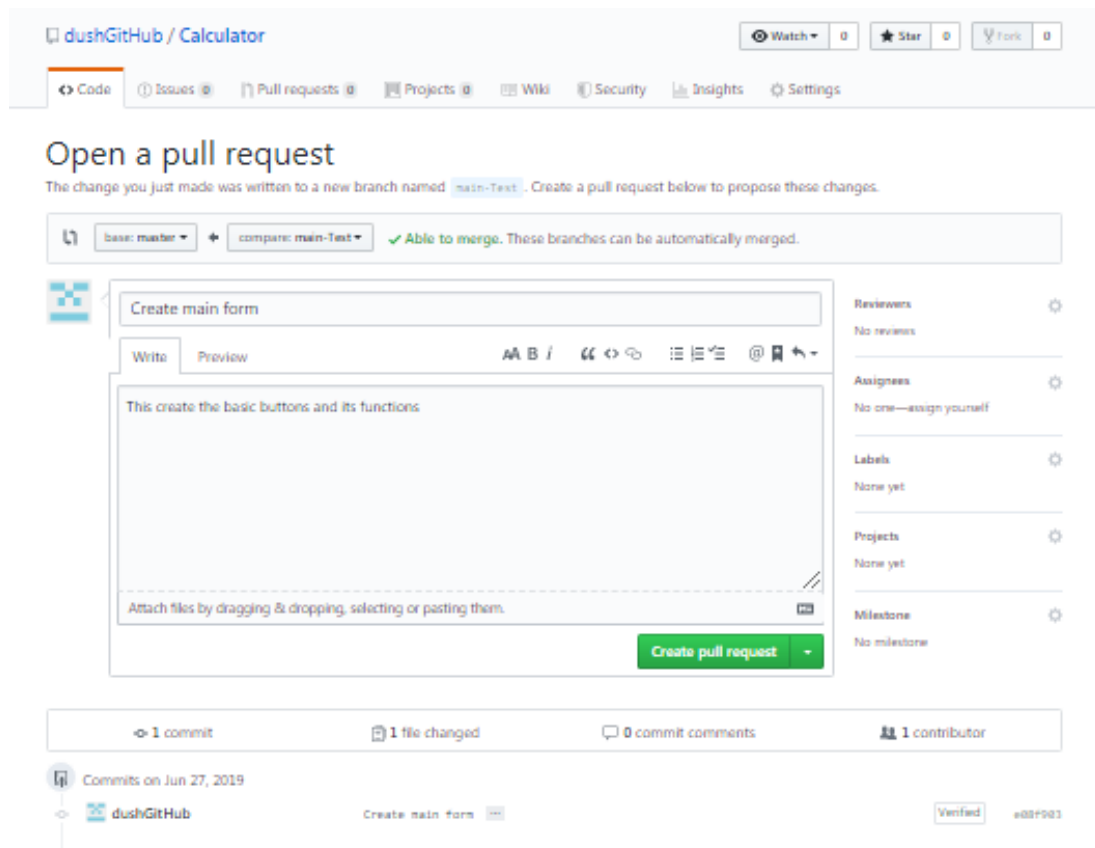


# Recommendations on upgrades and future enhancement

1. Add more functionalities to suit it as a programmer calculator
2. Add more functionalities to suit it as a statistic calculator
3. Narrow down the calculator as the scientific calculator and a basic calculator
4. Create a menu to be able to select either options mentioned above
5. Create new functionality to be able to store calculation with formula and output as user's interest.

## GitHub

Screen captures of creating a repository, making branches and merging them to the main branch:



## Create main form #1

[Edit](#)

**Open** dushGitHub wants to merge 1 commit into `master` from `main-Test`

Conversation 0 Commits 1 Checks 0 Files changed 1 +92 -0

dushGitHub commented now

This create the basic buttons and its functions

Create main form ... Verified e88f983

Add more commits by pushing to the `main-Test` branch on dushGitHub/Calculator.

**✓ This branch has no conflicts with the base branch**  
Merging can be performed automatically.

Merge pull request You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Write Preview

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Close pull request Comment

ProTip! Add comments to specific lines under [Files changed](#).

Reviewers  
No reviews

Assignees  
No one—assign yourself

Labels  
None yet

Projects  
None yet

Milestone  
No milestone

Notifications  
Customize  
Unsubscribe  
You're receiving notifications because you authored the thread.

1 participant

Lock conversation

## Create main form #1

[Edit](#)

**Merged** dushGitHub merged 1 commit into `master` from `main-Test` 24 seconds ago

Conversation 0 Commits 1 Checks 0 Files changed 1 +92 -0

dushGitHub commented 1 minute ago

This create the basic buttons and its functions

Create main form ... Verified e88f983

dushGitHub merged commit `1edda07` into `master` 24 seconds ago

dushGitHub deleted the `main-Test` branch now

Write Preview

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Comment

ProTip! Add comments to specific lines under [Files changed](#).

Reviewers  
No reviews

Assignees  
No one—assign yourself

Labels  
None yet

Projects  
None yet

Milestone  
No milestone

Notifications  
Customize  
Unsubscribe  
You're receiving notifications because you modified the open/close state.

1 participant

Lock conversation

---

# GitHub Public Access Link

<https://github.com/dushGitHub/Calculator.git>

## References

[https://en.wikipedia.org/wiki/Software\\_testing](https://en.wikipedia.org/wiki/Software_testing)