GENESIS - Learning Outcome & Mini-project Summary Report

LTTS
GLOBAL
ENGINEERING
ACADEMY

L&T Technology Services

Details

Ver. Rel. No.	Release Date	Prepared. By	Reviewed By	To be Approved	Remarks/Revision Details
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Contents

TEAM ACTIVITY – SIMPLE CALCULATOR

Using Agile

Introduction

A calculator is a mobile app that performs arithmetic operations on numbers. The simplest calculators can do only addition, subtraction, multiplication, and division. More sophisticated calculators can handle exponential operations, roots, trigonometric functions, and hyperbolic functions. Internally, some calculators perform these functions by repeated processes of addition. Portable, battery-powered calculators are popular with engineers and engineering students. The calculator we have designed will have

- Simple Calculations like addition, subtraction, multiplication, division and modulo division.
- Scientific Operations like nth power of a number, square root of a given number, factorial of a number and multiplicative inverse of a number.

Theme

Calculation

Epic1

Simple Calculation

User Stories1:

- As an accountant.
- I want to add 2 numbers.
- I want to see the result with less time.

Test Case:

- Given 2 numbers 3 and 5.
- When I add them.
- Result should be 8 with no time.

User Stories2:

- As a primary school teacher.
- I want to teach students about basic addition, subtraction, multiplication ,division, power ,modulo ,square root, factorial, inverse, currency, length, time.
- I want to get the results in less time.

Epic2:

Easy Set up and usages.

User Stories:

- As a Student.
- I want to reset the calculator
- So that I can start fresh.

Test Case1:

- Given I am in the middle of an operation.
- When I press CE (clear everything) key.
- Then the operation should be cancelled.
- And the display should show 0 show that it will be ready for next operation.

Test Case2:

- Given that the display status bar on the display shows 'M'.
- When I press CE key.
- Then the memory should get cleared and it should not display 'M'.
- And the display should show '0' for further operations

Using V Model

Ageing

Time	Gradation
Before	Analog-User had to interact more
Now	Scientific and digital
Future	Voice enabled input

Costing

Type	Cost
Standard	Rs. 250/-
Digital	Rs. 450/-
Scientific	Rs. 890/-

Requirements:

High Level Requirements:

ID	Description
HL_01	The calculator has the following keys: 0..9, ., +, -, *, /, ±, =, C, CE
HL_02	Calculator should display correct output
HL_03	The calculator is developed using standard C++ language and should run on all machines supporting g++ compiler.

Low Level Requirements:

ID	Description
LL_01	If the calculations are if not possible the calculator must display information helping the user to resolve the issue
LL_02	On encountering divide by 0 operation and operations on imaginary numbers calculator should display error message
LL_03	Should exit when the user tries to enter the choice more than the Specific choice given.

4W1H:

What:

- A scientific calculator is a type of electronic calculator, usually but not always handheld, designed to calculate problems in science, engineering, and mathematics.

Why:

- Because Modern days calculator includes high end engineering and mathematical computation capabilities.

Where:

- It is mainly used in educational and professional settings.

When:

- Scientific calculators are used widely in situations that require quick access to certain mathematical functions especially those that were once looked up in mathematical tables such as trigonometric functions or logarithms.

How:

- The software inside scientific calculator is capable of doing basic functions of arthematic operations, logarithms ,currency, inverse, length ,modulo, power and time.

SWOT Analysis

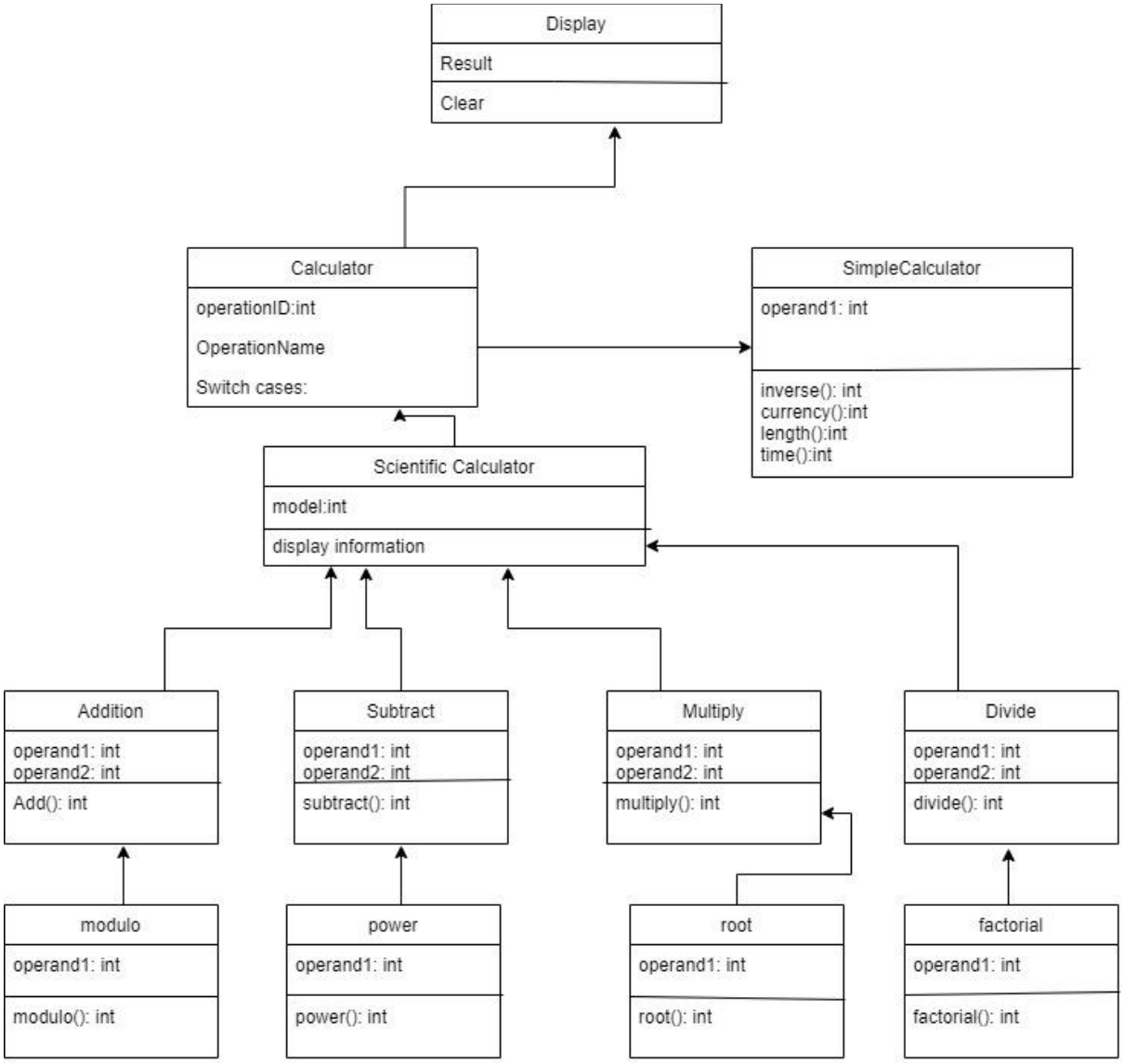
Strength 1. Perform basic arithmetic operations 2.Able to perform calculations for both positive and negative numbers 3. large number calculations	**Weakness** 1.basic knowledge needed 2.Continuous input should be provided
Opportunities 1. chance to get pro skills in C and C++ and git 2.Programming practice	**Threats** 1.Fault results for invalid inputs 2.infinite number display problem 3. imaginary numbers can't be displayed

Design

UML Diagrams

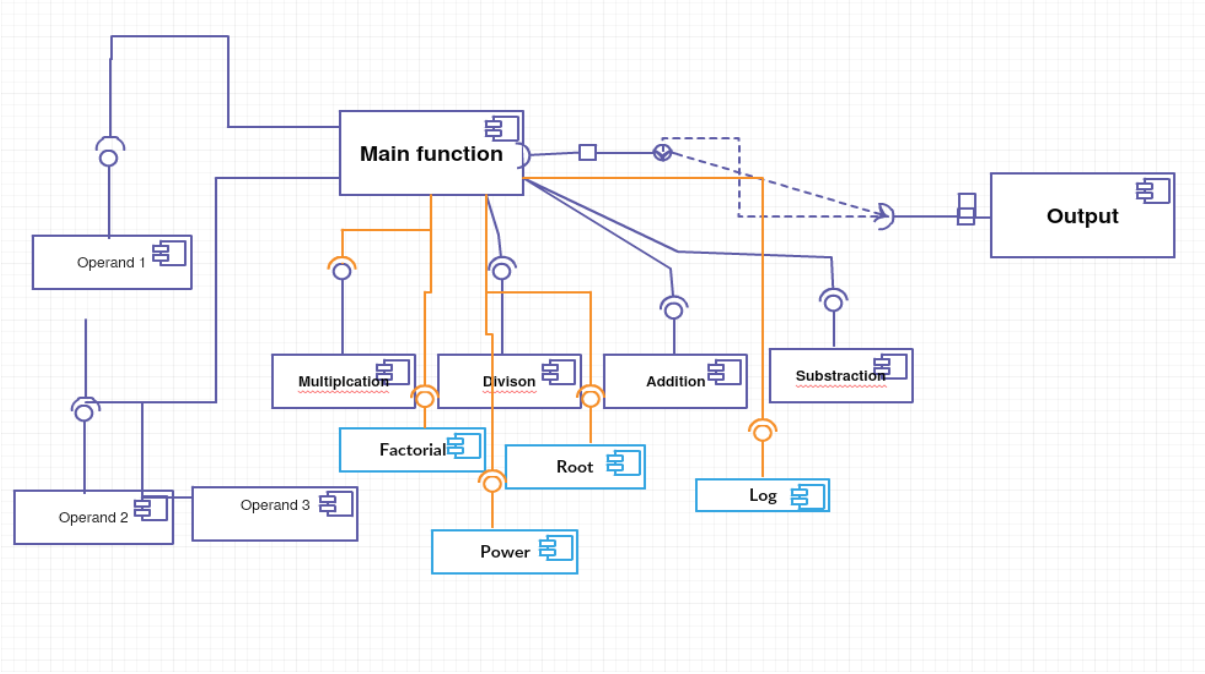
High Level Behavior Diagram

Class diagram



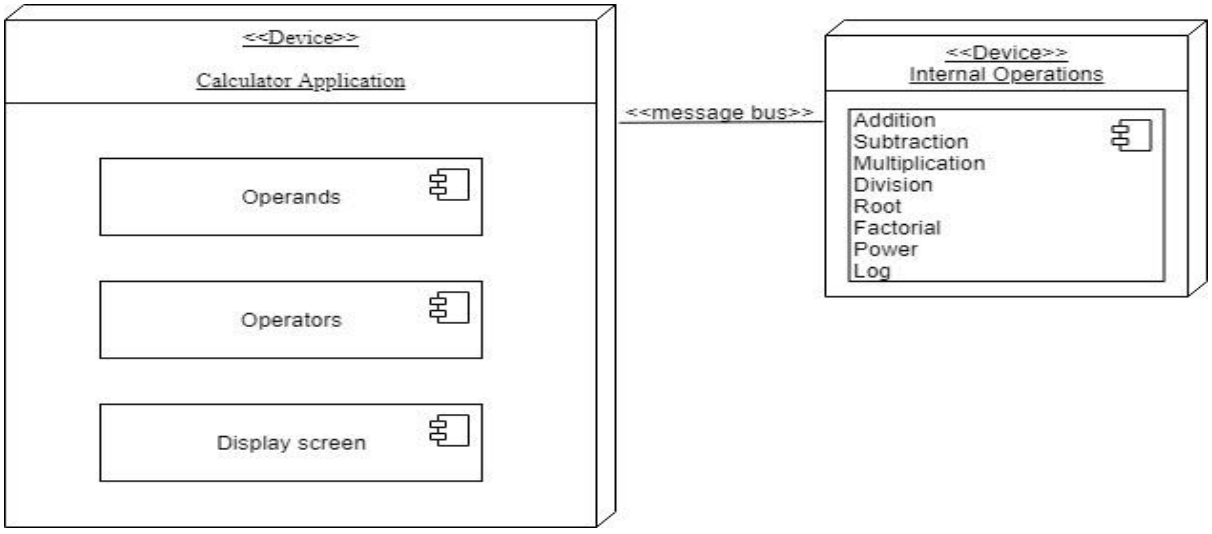
High Level Structural Diagram

Composite diagram

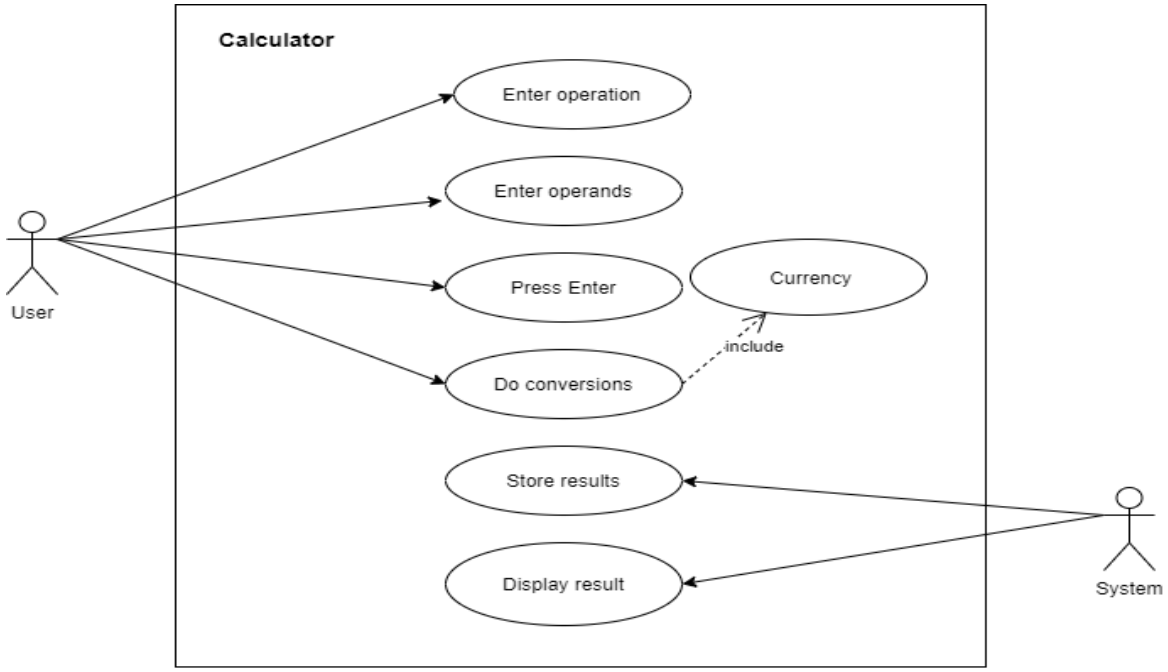


Low Level UML Diagrams

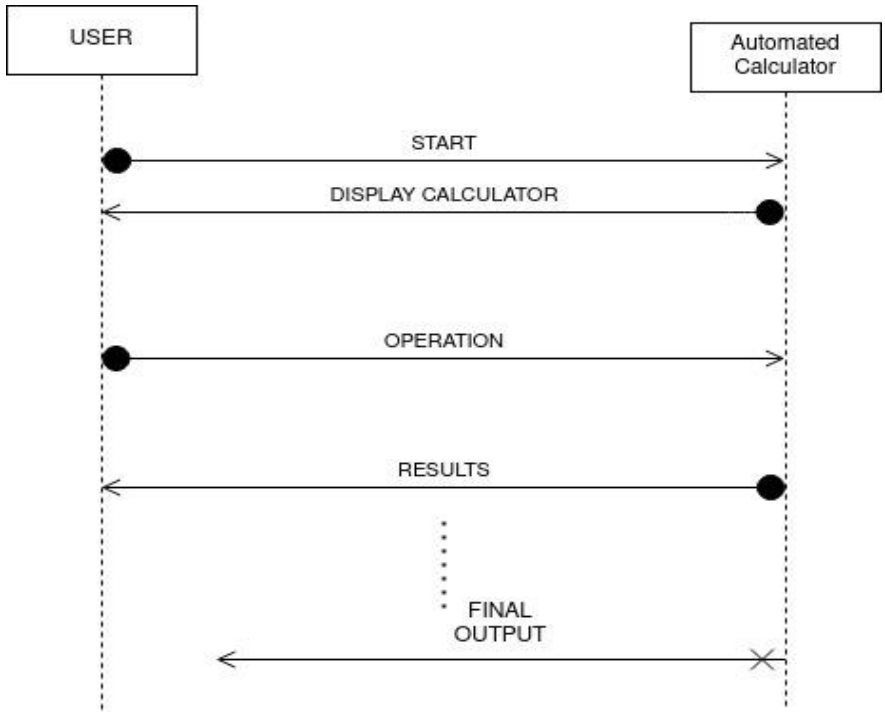
Deployment Diagram



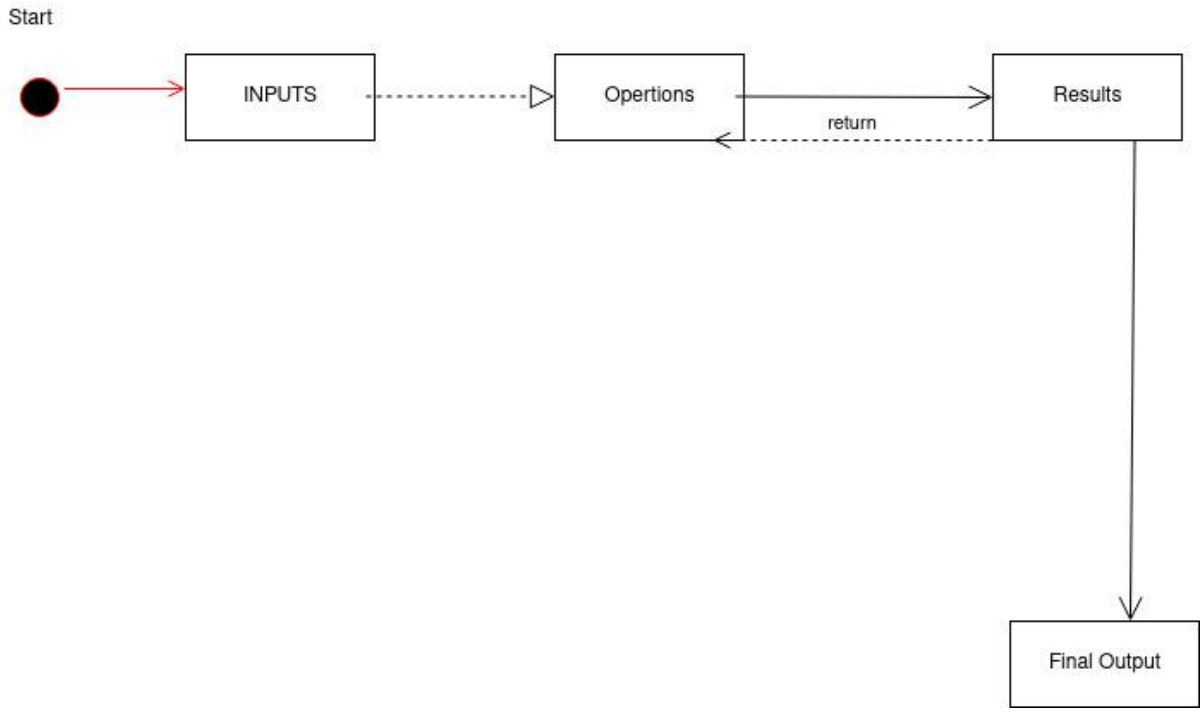
UseCase Diagram



Interaction Diagram



State Machine Diagram



Test Plan

High level Testing

ID	Description	Precondition	Expected Input	Expected Output	Actual Output
HL_01	Input method	Accept the input from key	Correct input	Display accepted input	Displayed accepted input
HL_02	Perform math operation	Correct calculation	Correct operands and operators are clicked by the user	Display result of performed operation	Displayed result of performed operation
HL_03	display	Display output	Display output and appropriate error message	Display result with clear visibility	Displayed with clear visibility

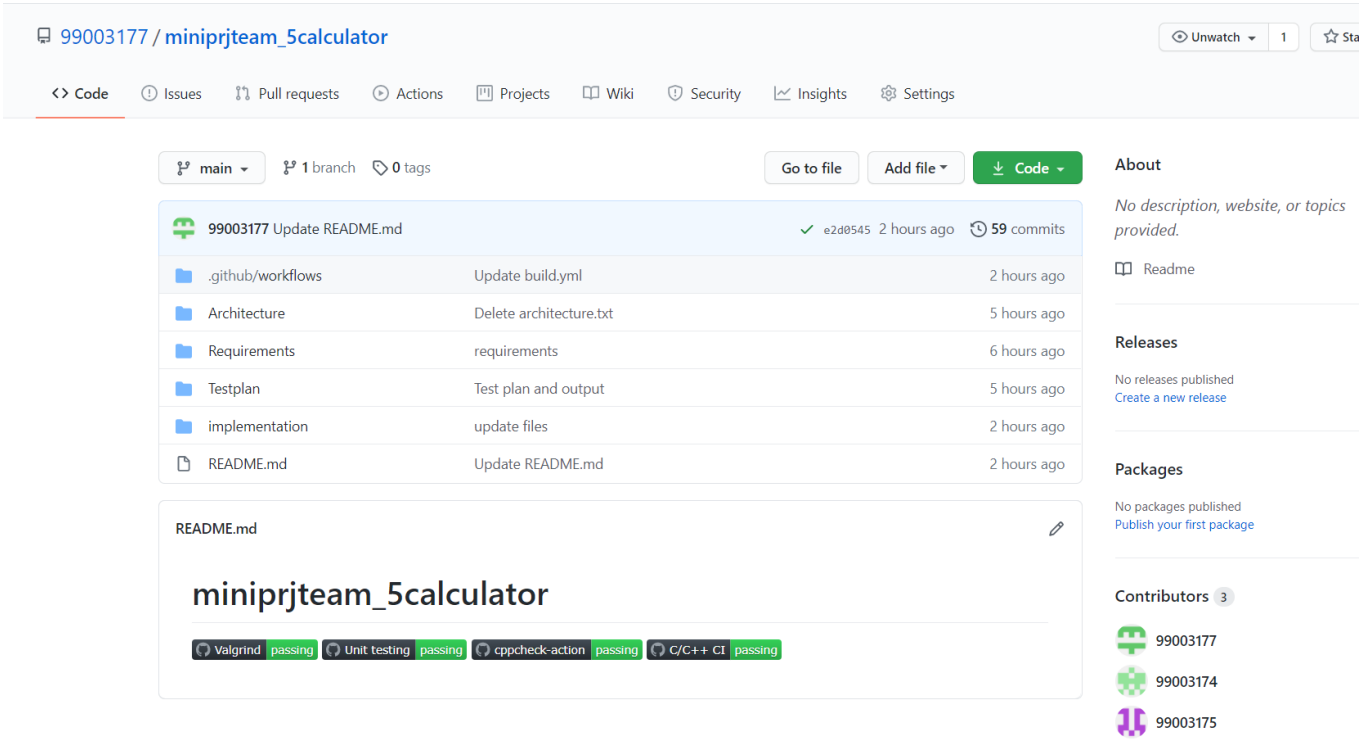
Low Level Testing

ID	Description	Precondition	Expected Input	Expected Output	Actual Output
LL_01	Divide by 0	denominator for the division operation is zero	Give input for the denominator as zero	Error message	Error
LL_02	Exit	Check condition	Correct input	When user tries to enter choice more than specific choice	It prints "Thankyou. Exiting the application"

ID	Description	Expected input	Expected output	Actual output	Result
T1	Addition	add(10,20)	30	30	Passed
T2	Subtraction	subtract(0,3)	-3	-3	Passed
T3	Multiplication	multiply(1,0)	0	0	Passed
T4	Division	divide(1,0)	0	0	Passed
T5	Inverse	Inverse(1)	1	1	Passed
T6	Modulo Division	modulo(1,0)	0	0	Passed
T7	Length	length(2)	24	24	Passed
T8	Time	time(2)	120	120	Passed
T9	Factorial	Factorial(5)	120	120	Passed
T10	Square Root	Squareroot(100)	10	10	Passed
T11	Currency	Currency(1)	74	74	Passed
T12	Power	power(10,2)	100	100	Passed

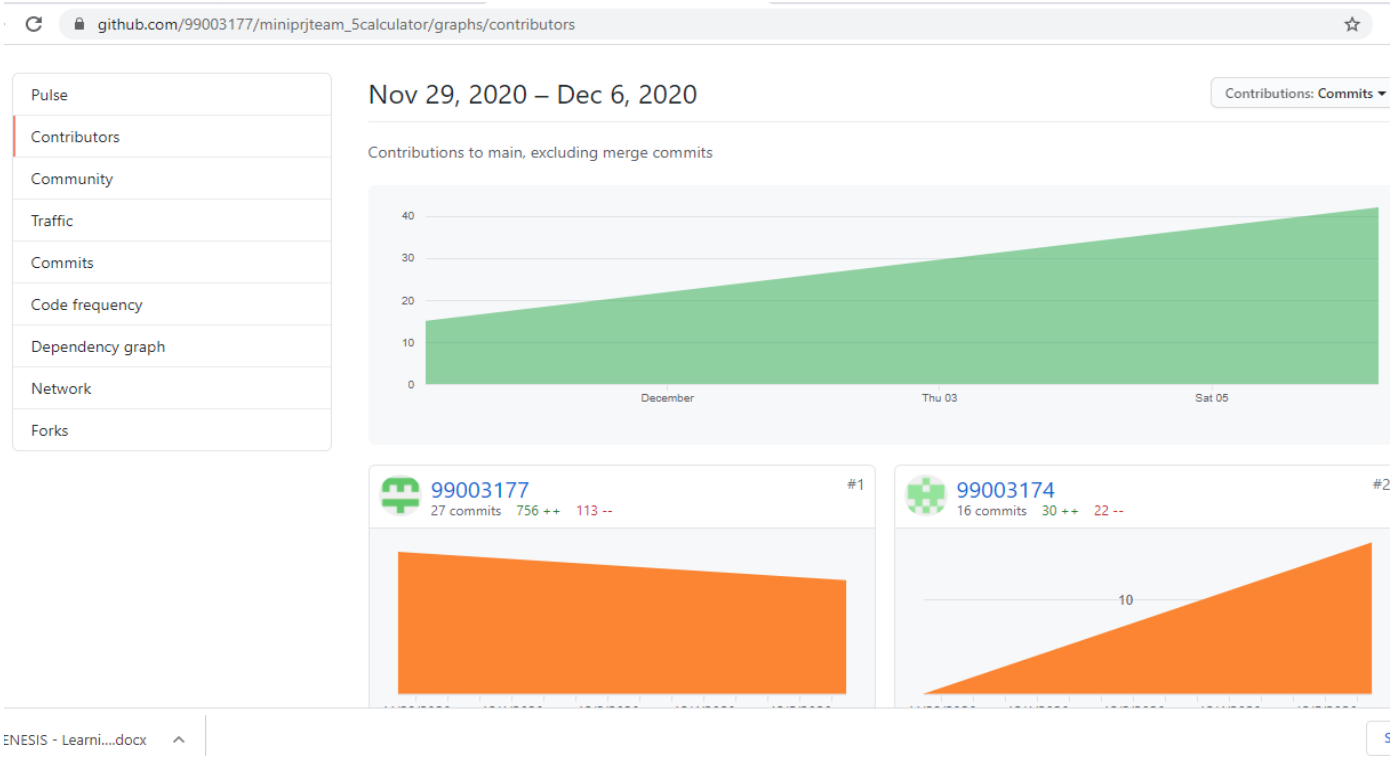
IMAGES:

BADGES:

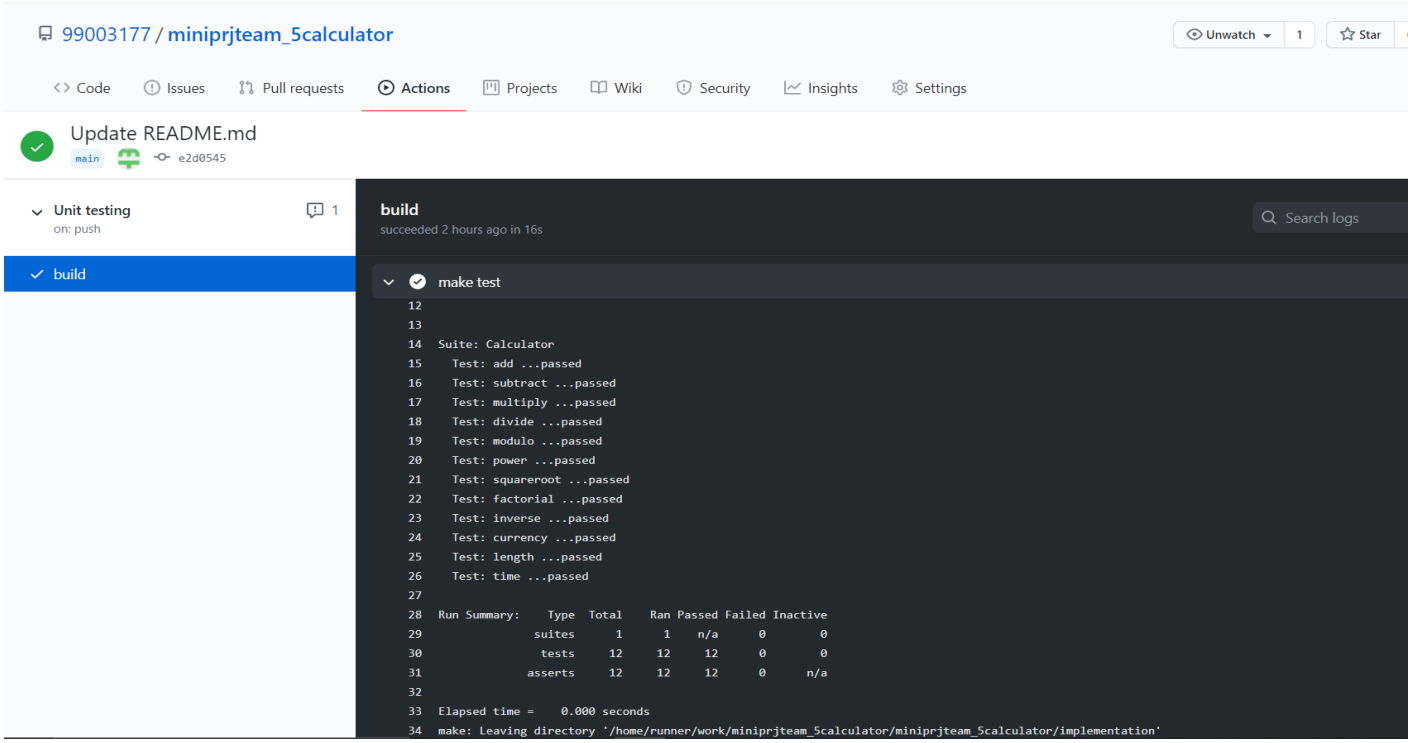


Git Link: 99003177/miniprjteam_5calculator (github.com)

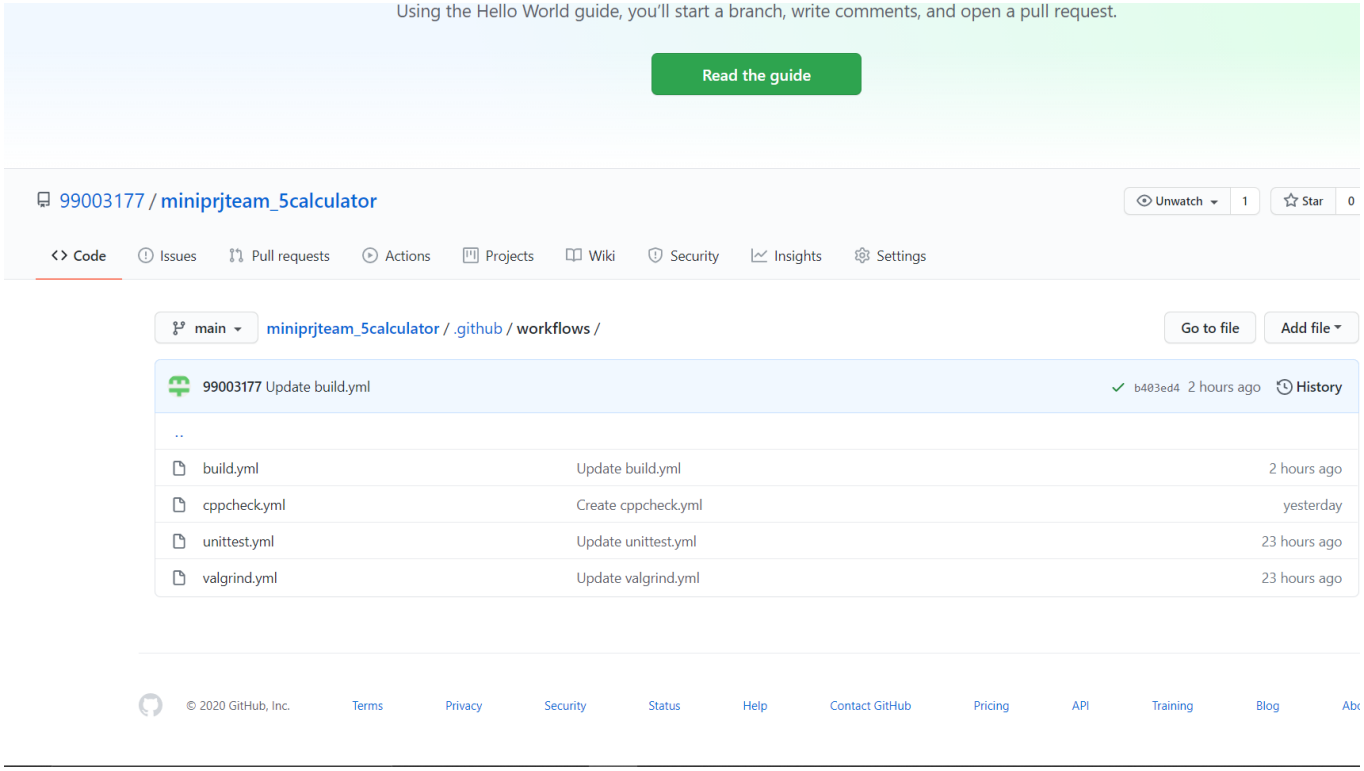
Contributions:



UNIT-TESTING:



Workflows:


Using the Hello World guide, you'll start a branch, write comments, and open a pull request.
Read the guide
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Wiki
Security
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Settings
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REFERENCES:

[1]https://codeforwin.org/2015/06/c-program-to-create-simple-calculator-using-switch-case.html

[2] https://scanftree.com/programs/c/simple-calculator-using-switch-statement-in-c/