Group 4

Arithmetic Expression Evaluator

Test Case

Version 1.0

Revision History

Date	Version	Description	Author
9/25/2024	0.0	Initial meeting, discussion of meeting times, and assigning roles for the project	Alexander Carrillo
10/16/2024	1.0	Software requirements discussion, reviewing rough code, talking about next steps	Alexander Carrillo
11/4/2024	**1.0**	Software architecture design discussion and writing of document	Alexander Carrillo
12/2/2024	1.0	Use Case and Implementation Discussion, writing of document 05 use cases	Alexander Carrillo

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Test Case

1. Purpose

The purpose of this test suite is to verify the integrity of the software system with respect to input collection and parsing, valid operation functionality, graceful error-handling mechanisms, output generation and data conversion, and then output (or error message) presentation to the user. Thus, the test suite will determine whether the system successfully and accurately retrieves input data for a given operation from the user, parses and stores the data, retrieves the data and conducts the intended operation using it, and presents the expected output of the operation to the user. Additionally, the suite will also test the independent functionality of the GUI, and whether its constituent widgets work accurately for intended data retrieval and handling.

2. Test case identifier

- C1: test case 1
- C2: test case 2
- C3: test case 3
- C4: test case 4
- C5: test case 5
- C6: test case 6
- C7: test case 7
- C8: test case 8

3. Test item

- C1
  - shows the functionality of individual operations (+, -, /, *, **, %)
- C2
  - shows the functionality of PEMDAS or order of operations
- C3
  - shows the functionality of nested parentheses
- C4
  - shows the functionality of assigning positive or negative values
- C5
  - Shows the error handling of unmatched parenthesis
- C6
  - Shows the error handling of dividing or modulating by 0
- C7
  - Shows the error handling of misplaced operators
- C8
  - Shows the error handling of unexpected symbols
- C9
  - Shows the error handling of an empty input

4. Input specifications

- C1
  - any input that uses multiple operators
  - (5+3)+(9-1)+(16/2)+(2*4)+(28%20)+(2**3)
- C2

    - an input that uses multiple different types of operators that have different priority levels in PEMDAS
    - 4-2/2+6
- C3
    - an input where a set of parentheses are inside another set
    - 8+(4/(3-2))
- C4
    - an input where an integer is assigned as either a positive or negative number
    - 2+(-4)
- C5
    - an input where a parenthesis is unmatched
    - (5+1
- C6
    - an input where a value is divided by 0
    - 1/0
- C7
    - an input where an operator is improperly placed
    - 5+*7
- C8
    - an input where a non-expected symbol is included (. ,letters,etc.)
    - (Power Rangers, Assemble) + 7.8
- C9
    - an input where no data is provided by the user (i.e. empty input)
    - [empty input]

5. Output specifications

- C1
    - output: 48
- C2
    - output: 9
- C3
    - output: 12
- C4
    - output: 2
- C5
    - output: Error Message
- C6
    - output: Error Message
- C7
    - output: Error Message
- C8
    - output: Error Message
- C9
    - output: Error Message

6. Use Case Table

ID	Name	Purpose	Inputs	Expected Outputs	Observed Outputs	Pass/Fail

C1	Operators	Test functionality of all operators	(5+3)+(9-1)+(16/2)+(2*4)+(28%20)+(2**3)	Returns a valid integer	48	**Pass**
C2	PEMDAS	Test functionality of order of operations	4-2/2+6	Returns a valid integer	9	**Pass**
C3	Nested Parentheses	Test functionality of nested parentheses	8+(4/(3-2))	Returns a valid integer	12	**Pass**
C4	pos/neg assigning	Test functionality of assigning	2+(-4)	Returns a valid integer	-2	**Pass**
C5	Unmatched Parenthesis	Test error handling for unmatched parenthesis	(5+1	Returns an error message	Returns an error message	**Pass**
C6	Divide by 0	Test error handling for dividing or modulating by 0	1/0	Returns an error message	Returns an error message	**Pass**
C7	Misplaced Operator	Test error handling for misplaced operators	5+*7	Returns an error message	Returns an error message	**Pass**
C8	Invalid Symbol	Test error handling for unexpected symbols in the input	(Power Rangers, Assemble) + 7.8	Returns an error message	Returns an error message	**Pass**
C9	Empty Input	Test error handling for empty input provided	[empty input]	Returns an error message	Returns an error message	**Pass**

7. Environmental needs

7.1.1 Hardware (*nothing particular for the arithmetic expression project*)

Specify the characteristics and configurations of the hardware required to execute this test

7.1.2 Software (*nothing particular for the arithmetic expression project*)

Specify the system and application software required to execute this test case. This may include system software such as operating systems, compilers, simulators, and test tools. In addition, the test item may interact with application software.

7.1.3 Other

Specify any other requirement.

8. Special procedural requirements

Describe any special constraints on the test procedures that execute this test case. These constraints may involve special set up, operator intervention, output determination procedures, and special wrap up.

9. Intercase dependencies

List the identifiers of test cases that must be executed prior to this test case. Summarize the nature of the dependencies.