Calculator Requirements (v3.0)

**Introduction:**

The main goal of this project is to create a calculator that must perform the following requirements.

**Non-Functional Requirements:**

1. The Calculator program will be written in the Python language.

**Functional Requirements:**

1. The Calculator will run on the command line.
2. The Calculator program will allow whitespace between operands and operators.

For example:

If we have 1\_+\_10 as an input (where “\_” is a whitespace), the program will take it as 1+10 and produce the result of 11.

1. The Calculator program will verify whether an equation that is received as input is formatted correctly or not.

For example:

Inputting 1+ is incorrect, since there is a missing operand.

Inputting +1, however, will be considered as a unary operation and will produce 1 as the result.

1. The Calculator shall take an expression and evaluate it, as well as show the components that make up the expression.

For example:

Inputting 11+9 will produce the following:

Evaluation: 20

Components:

Integer, Value 11

Whitespace

Operator, Value '+'

Integer, Value 9

Note: Any remaining examples will only show the “Evaluation” portion of the output.

1. The Calculator shall be able to take in two integers and perform addition on them.

For example:

Inputting 1+10 will produce 11 as a result.

1. The Calculator shall be able to take in two integers and perform subtraction on them.

For example:

Inputting 10-9 will produce 1 as a result.

1. The Calculator shall be able to take in two integers and perform multiplication on them.

For example:

Inputting 10\*9 will produce 90 as a result.

1. The Calculator shall be able to take in two integers and perform integer division on them. If the result of the division is a decimal, the Calculator will round up or down to the nearest integer.

For example:

Inputting 90/10 will produce 9 as a result.

Inputting 5/2 will produce 3 as a result.

Inputting 1/3 will produce 0 as a result.

1. The Calculator shall check if the denominator of a division query is 0, and if so it will produce the result of “undefined”, regardless of what the numerator is.

For example:

Inputting 9/0 will produce the result “undefined”.

1. The Calculator shall allow as input equations that contain consecutive operations to be performed.

For example:

Inputting 1+1+1+1 will produce 4 as a result.

Inputting 10-1-1-1 will produce 7 as a result.

Inputting 10+1-2 will produce 9 as a result.

1. The Calculator shall allow unary operation (+/-) on any integer.

For example:

Inputting -9 will produce the result -9.

Inputting --9 (that’s two minus signs) will produce the result 9.

Inputting +9-1 will be the same as inputting 9 -1 which will produce the result of 8.

Inputting -9-1 will produce the result of -10.

1. The Calculator shall check the order of operators and determine what will be executed first based on the precedence. Multiplication (\*) and division (/) have the highest precedence from left to right, follow by addition (+) and subtraction (-).

For example:

Inputting 2+3\*4/2 will produce 8 as a result.

1. The Calculator shall allow for multiple calculations to be performed before a session is terminated. If the user does not type in “quit”, the program will keep asking the user to input another equation.