

## Task: Write a command line application “Calculator”

The command line application should allow to enter a line of simple arithmetic or algebra expression and produce result of the calculation.

Examples:

$4+5*2$  -> Should give an answer 14

$X+2*9-8/3$  (2-1) – 32.4 -> After asking for value of x, the application should give an answer of the computation.

## Guidelines

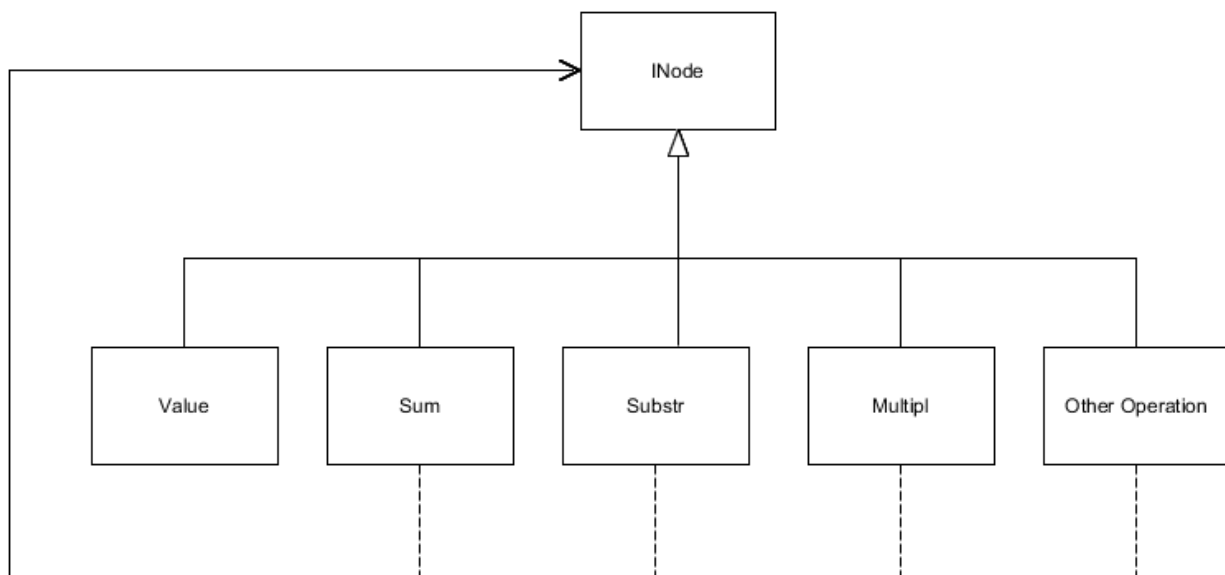
1. Use CMake for build configuration

It is recommended to write the application using Visual Studio Code. Here is an example how to start:

<https://code.visualstudio.com/docs/cpp/cmake-quickstart>

2. Application should be written in object oriented C++

The suggested class diagram should be as displayed in this picture:



Inode – an interface class for the Node with two functions: e.g. print and calc.

Value – A simple class that holds only a value

Sum – a class that performs the operation of the “+” operator

Etc.

Create a separate class that requests the user input to fill variables (such as x, y, z, etc.) if the expression line contains them.

E.g.  $x+2*9-8/3*(2-1)-32.4$  should ask for the variable x.

### 3. An object tree should be constructed

Here are a couple examples of how a tree can describe the calculation. A parser should construct such a tree from the expression string.

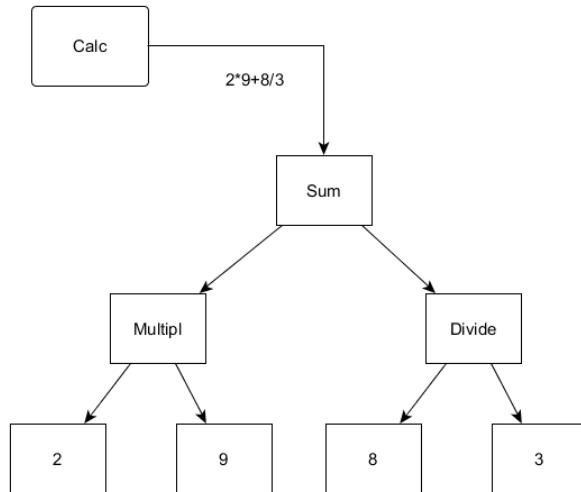


Figure 1: Expression  $2*9+8/3$

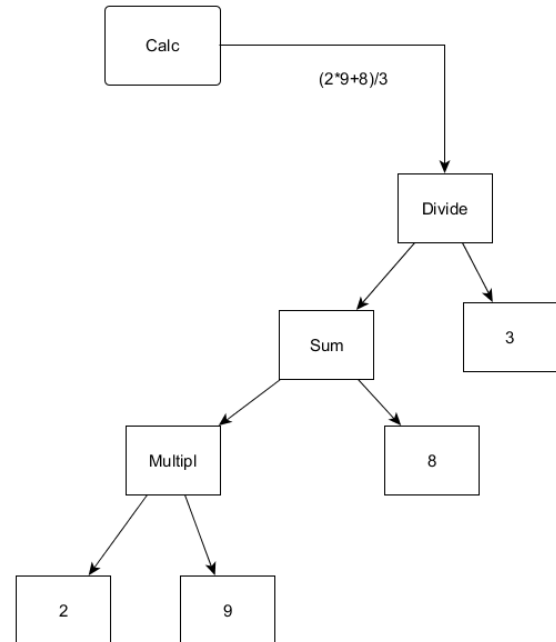


Figure 2: Expression  $(2*9+8)/3$

### 4. Printing function which adds parentheses to display the order of calculation should be implemented

Entered line:  $4+5*2$

Printed line:  $(4 + (5 * 2))$

### 5. At least a couple unit tests should be implemented with GTest

For introduction please see <https://google.github.io/googletest/quickstart-cmake.html>

Example of test cases: TestSum.cpp , TestSubstr.cpp

### 6. The program should be working, test shall run successfully

In case of any questions or clarifications do not hesitate to reach out to us.