Java Candidate Homework

Your assignment is to implement a simple command-line calculator, publish it to a public Git repository, and (for extra credit) set up a continuous integration build using one of the many public CI services such as Travis-CI, CodeShip, CloudBees, etc.

# Assignment

## Functional Requirements

Write a calculator program in Java that evaluates expressions in a very simple integer expression language. The program takes an input on the command line, computes the result, and prints it to the console.  For example:

% java calculator.Main "add(2, 2)"

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Few more examples:

|  |  |
| --- | --- |
| **Input** | **Output** |
| **add(1, 2)** | 3 |
| **add(1, mult(2, 3))** | 7 |
| **mult(add(2, 2), div(9, 3))** | 12 |
| **let(a, 5, add(a, a))** | 10 |
| **let(a, 5, let(b, mult(a, 10), add(b, a)))** | 55 |
| **let(a, let(b, 10, add(b, b)), let(b, 20, add(a, b))** | 40 |

An expression is one of the of the following:

* Numbers: integers between Integer.MIN\_VALUE and Integer.MAX\_VALUE
* Variables: strings of characters, where each character is one of a-z, A-Z
* Arithmetic functions: add, sub, mult, div, each taking two *arbitrary expressions* as arguments.  In other words, each argument may be any of the expressions on this list.
* A “let” operator for assigning values to variables:

**let(<variable name>, <value expression>, <expression where variable is used>)**

As with arithmetic functions, the value expression and the expression where the variable is used may be an arbitrary expression from this list.

## Logging

Implement a logging layer to log all relevant information. Manage at least 3 levels of verbosity: INFO, ERROR, and DEBUG. Allow verbosity to be set via a command-line option.

## Build

Create a Maven or Gradle build definition so your project may be built in any standard Java environment.

## Final note

Please submit what you would consider ***testable and maintainable production code***.  If the statement of the problem is unclear, feel free to make assumptions, but please state your assumptions in the solution.

You are free to use any third-party framework.

# Git Repository

Please publish your project to a public Git repository (e.g. GitHub, BitBucket, etc.). Please ensure that we can clone the repo and view source, commit history, etc.

# Continuous Integration (Optional)

Please set up a continuous integration build on one of the public CI services such as Travis-CI, CodeShip, CloudBees, etc.