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)"
4
```

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.