

Problem Description

Your task is to write a command-line program to evaluate a set of equations, each specified on separate lines. An equation is defined by:

`<LHS> = <RHS>`

`<LHS>` is the left-hand side of the equation and is always a variable name. A variable name can only be composed of letters from the alphabet (e.g. for which `isalpha(c)` is 1). `<RHS>` is the right hand side of the equation and can be composed of variables, unsigned integers, and the `+` operator.

Here is one example set of equations:

```
offset = 4 + random + 1
location = 1 + origin + offset
origin = 3          + 5
random = 2
```

Your program should take a filename as input. The file contains a set of equations, like the above. It should evaluate the set of equations and print the unsigned integer value of each variable.

`<variable name> = <unsigned integer value>`

The output should be sorted by in ascending order by variable name.

The output for the example above would be:

```
location = 16
offset = 7
origin = 8
random = 2
```

You may assume the following: You may assume the input is well formed. There will be one or more white spaces between each token. You may use C++, the Standard C libraries and the Standard Template Library (STL). You may use `std::sort` and `qsort`. All variables in the equation set will have a definition. You may also assume a variable is only defined once and will have a valid integer solution.

Submission

We recognize that your time is valuable so please wind down your investigations if you hit the 3 hour mark, or earlier if you hit diminishing returns.

Submit your submission to me via email with the following:

1. Source code
2. Example output
3. (if necessary) instructions on how to build and execute your code
4. (optionally) any thoughts you'd like to share