Project 1: Interpreter for Programming Langauge: Calc

Assignment Overview (Due: Feb. 17. Difficult Level: ***)

This project is designed to reinforce concepts of parsing, regular and context-free grammars.

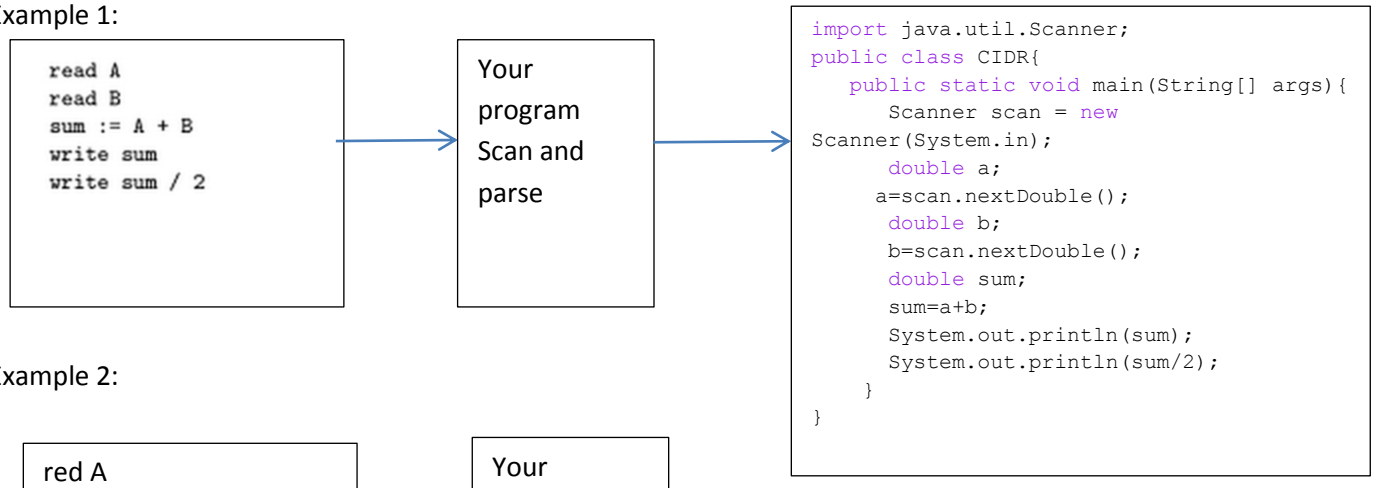
Project Statement

Build a front-end interpreter for the following tiny, toy language Calc. The language Calc is defined by the following grammar rules. The target language is Java language.

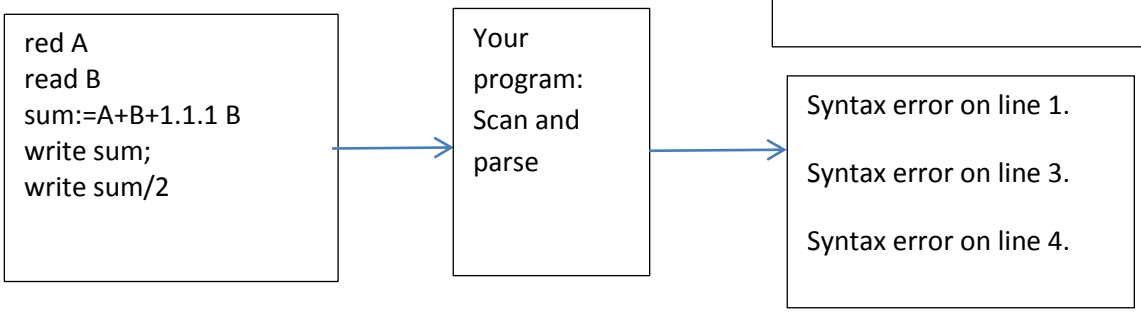
```
program    ⟶  stmt_list $$
stmt_list  ⟶  stmt stmt_list | ϵ
stmt       ⟶  id := expr | read id | write expr
expr       ⟶  term term_tail
term_tail  ⟶  add_op term term_tail | ϵ
term       ⟶  factor factor_tail
factor_tail ⟶ mult_op factor factor_tail | ϵ
factor     ⟶  ( expr ) | id | number
add_op     ⟶  + | -
mult_op    ⟶  * | /

id     ⟶  letter ( letter | digit )*
          except for read and write
number ⟶  digit digit* | digit* ( . digit | digit . ) digit*
```

Your program will read a Calc program, then perform lexical and syntax analysis, report any syntactical errors if the given Calc program is not a valid program; otherwise, it will output a java program without syntactical error.

Example 1:



Example 2:



Notes and Hints:

- Start early on this project so that you know how much work is involved. It is as not easy as what you think in order to capture all the syntax errors.

Deliverables

- Electronically submit all your project files to D2L, and present it on Feb. 17th.