Interpreter Assignment #1: Expressions and Assignments

Issued: Tuesday, September 16
Due:　　Tuesday, September 30

Purpose

This assignment asks you to extend a small interpreter.

Source Code and Grammar

A Java implementation of the interpreter is at:

```
1  ~buff/classes/354/pub/ia1
```

The interpreter employs an ad-hoc scanner and a recursive-descent parser. The parser builds a strongly typed parse tree, which is then traversed and evaluated. A grammar for the source language is:

```
1   stmt  : assn ';'
2   assn  : id '=' expr
3   expr  : term addop expr
4         | term
5   term  : fact mulop term
6         | fact
7   fact  : id
8         | num
9         | '(' expr ')'
10  addop : '+'
11        | '-'
12  mulop : '*'
13        | '/'
```

Assignment

There are several parts:

- Document the provided source code.

- Extend the scanner to support comments. Design your own form of comment.

- The grammar specifies that a program is exactly one assignment statement. However, `main` interprets each of its arguments as a separate program, trying to modify variable values accordingly. Change the interpreter so this works correctly.

- Add a prefix unary minus operator. This is a grammatical change; simply allowing negative numbers is insufficient.

- The interpreter currently supports only integer values. Change it to instead support double values.

- Test your solution thoroughly. Add tests to my rudimentary test suite. The quality of your suite will influence your grade.