

CS5214 –DESIGN OF OPTIMISING COMPILERS

Programming Assignment 1

Due: February 5, 2016, 2359hours

Notes for the programming assignment:

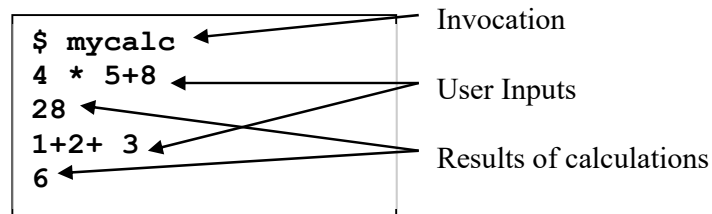
1. This assignment is to be done on an individual basis. While you can discuss the assignment with others as much as is necessary, plagiarism will be doubly penalized – both the copier *and* the copied will be penalized.
2. The assignment is due February 5, 2016 at 2359 hours. This is a hard deadline.
3. The assignment must be done on a Unix (preferably PC-Linux) platform.
4. A tar-ball (i.e. zip up your entire directory with tar and then gzip it) of your code should be uploaded to the “Student Submissions” folder of the course IVLE site no later than the due date. Late submissions will be penalized. This tar-ball should be named as follows:

<your-name>-assignment-1.tar.gz

5. To make my job of running your code easier, the tar-ball should include a **README** file that explains in detail how your code is to be compiled and executed. *Please remember to include your name and student number in it.*
6. You are also required to submit a hardcopy of a write up (should be no more than 5 pages) describing your solution. Remember to include your name, matric number, and the filename of the tar-ball you emailed.

Description of Assignment 1

Using JLex (or JFlex) and CUP, implement a simple calculator that will parse an arithmetic expression and return the result. Here is an example of the behaviour of your program:



You should have no problem obtaining documentation for JLex/JFlex and CUP – see for example: <http://www2.cs.tum.edu/projects/cup>.

Note that you should allow *Num* to be input in any of the following form:

- Floating point numbers, eg. 1.234
- Exponent form of floating points, eg. 1.23e3 (which is 1.23×10^3)
- Hexadecimals a la C style, eg. 0xdeadbeef
- Integers in decimal, eg. 1234 or -1234

You should at least implement +, -, *, /, ^ (exponentiation) and the parenthesis (for precedence indication). In addition, you are free to add to the list of functions supported (square root, log, trigonometric functions, shifts and logical functions) – just make sure you document it clearly.

I prefer that you stick to JLex/JFlex and CUP but should you wish to change your choice of tool, kindly email me and I will decide if it is ok.

Grading:

For this assignment, the grading criteria shall be as follows:

1. Correctness of implementation – 20%
2. Additional advanced features – 10%
3. Documentation and ease of marking (compilation, use etc. – yes, you make my life difficult, I penalize you ☺) – 10%

The Report:

For this report, please do not merely do a code dump. Instead, here a few points that you can consider elaborating on:

- What difficulties did you encounter? How did you overcome them?
- Any clever tweaks to your production rules.
- What were the conflicts that arose and how did you handle them?
- What extra features did you add?
- What cool features would you have liked added but could not find the time to do so?