Spring 2019 CSC 419 - Programming Languages - Assignment 2

Due date: Tuesday, Feb 12, 2019, by midnight, upload in home folder of class

Please put your full name on the assignments!

All your files for an assignment should be in a subdirectory in your home directory. The subdirectory should be named "assignmentX' where X is the assignment number. The TA will pick up the files from this subdirectory after the deadline for the assignment.

Exercise 2.1

Similar to what we did in class for the C **Union** data structure, write EBNF descriptions (and also show example code that can result from the EBNF description) for the following. Please do the EBNF description yourself and not from a web search. [10 points]

a) A **struct** data structure in C

b) A **switch** statement in C or Java

Exercise 2.2*

a) Given the following EBNF declarations (based on Modula-2)

<simple expression> => [+ | -] <term> { + <term> | - <term> | OR <term> }
<term> => <factor> { * <factor> | / <factor> | DIV <factor> | MOD <factor> | AND <factor> | & <factor> }
<factor> => <number> | <ident> | (<simple expression>) | NOT<factor>
<ident> => <letter> { <letter> | <digit> }

Simplify the expressions for <simple expression> and <term> by adding other nonterminal definitions so that you can reduce the number of options in the braces.
[5 points]

b) Construct five examples of a <simple expression>, using only terminals in the language. Try to make each example significantly different from the others so as to illustrate the range of expressions which this definition encompasses. Assume simple definitions for <letter> (i.e., a..z, A..Z), <digit> (i.e., 0..9), and <number> (i.e., <digit>{<digit>}) although the actual definitions in Modula-2 are more complex.
[5 points]