COMPUTER SCIENCE 322 (Winter Term 2004)
Compiler Construction
Prof. Levy

Problem Set 2

Due Wednesday 21 January

Reading Assignment: Dragon Book Sections 2.6, 3.1, 3.3-3.5

Written Assignment

1. In a string of length n, how many of the following are there? Don't forget the empty string!

a) prefixes
b) suffixes
c) substrings
d) proper prefixes

2. Give a numerical description of the languages formed by the following regular expressions. Your answer should *not* mention zeros and ones:

a) $(0|1)^*0$
b) 1^+
c) 10^*
d) $(01)^+$

3. Write a regular definition[1] for the following languages:

a) All strings of letters that contain the five vowels in order.
b) All bitstrings lacking the substring `01`.
c) Variables in Prolog.
d) Comments in Java, where a comment begins in `/*` and ends in `*/`, and cannot properly contain the latter. Your alphabet should be all alphanumeric characters, as well as the set {`/`, `*`, BLANK, TAB, NEWLINE,}.

Turn these in to me on paper.

[1] Example 3.4 on page 96 illustrates a regular definition.

Programming Assignment

Download JFlex, CUP, `fragment.flex`, `Makefile`, and the test files from the class web page. Modify the `PATH` variable in your `.bashrc` or `.bash_profile` to include `JFlex/bin`. In the directory where you saved `fragment.flex`, make a symbolic link to the `java_cup` directory. Copy `fragment.flex` into a file `ml_let.flex`, and modify the latter to do the necessary lexical analysis for the ML **let** grammar from the previous assignment. When you're done, copy your `ml_let.flex` into the turnin folder.