CS 1622 – Homework 1
Due: Monday, October 1, 2012 at the start of class

Please submit a typewritten document. I'd prefer you draw your finite state machines on the computer, but if this is a challenge, you may hand draw them neatly on the paper by hand.

1.) Write the following regular expressions:

      a.) Binary numbers that are multiples of four.

      b.) Valid C/Java integer constants that can be negative or positive, in decimal, octal, or hexadecimal.

      c.) A block comment without nesting (/* to */)

2.) Convert the following regular expression to an NFA (alphabet is {a,b}):

$$a?b*aba+$$

3.) Convert your NFA from question 2 into a DFA.

4.) Write a grammar that a four-function calculator may implement. The terminals are:

$$\texttt{integers, +, -, *, /}$$

Make sure to express the proper precedence in your grammar.

5.) Construct an LL(1) parse table for your grammar from 4. Show the First and Follow sets you generated.

6.) Show the action list for the input:

$$\texttt{int + int + int * int - int}$$