

CS 1622 – Homework 1

Due: Tuesday, February 11, 2014 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 eight.

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

c.) A string literal without escape sequences

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

`a+bab?a`

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

4.) Write a grammar that a logic solver may implement. The terminals are:

`true, false, &, |, !`

Make sure to express the precedence that ! (not) is higher than & (and) is higher than | (or) 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:

`!true | false & true`