Homework Assignment #1

Due: Friday, October 5, 2007

0. Write a regular expression for the language of symbolic Internet domain names, such as `cs.washington.edu`. Numbers, letters (upper and lowercase) and dash are legal, but starting or ending with a dash is not allowed.
1. Convert the following regular expression to a NDFA:

    (bcd|a*cd)* | x*a | xaxcd
2. Convert the NFA into a DFA, following the algorithm from class. Be sure to label the NFA states and to label each of the DFA states with a set of NFA states.
3. In the first lecture an intermediate compiler representation called "three address code" was mentioned. For example,

    ```
    t0 := 1;
    t1 := num < t0;
    ifnonzero t1 goto L0;
    t2 := 1;
    t3 := num - t2;
    t6 := 4;
    t7 := num * t6;
    numAux := t7;
    goto L2;
    ```

The language should be pretty obvious. There are temporary registers, e.g. `t<integer>`, normal identifiers from the source language, e.g. `num`, key words, e.g. `ifnonzero`, and operators. Write the lexical grammar for this language (using the extended rules from class is OK). You only need to handle symbols occurring in this example.

Produce a hard-copy of your answers and turn them in by the start of class on the due date. Do these exercises individually, not with your project partner.