CS 3100 – Models of Computation – Fall 2011
This assignment is worth 8% of the total points for assignments
100 points total

September 15, 2011

Assignment 4, Posted on: 9/15 Due: 9/22 Thursday 11:59pm

This assignment involves the use of JFLAP which will be illustrated in class on 9/15. JFLAP is available for your use by typing on CADE machines `/home/cs3100/jflap/bin/jflap`. JFLAP is extremely easy to install on your own own machines, from `http://www.cs.duke.edu/csed/jflap/`

1. **15%** Draw the NFA for L_{div3} in JFLAP. Simulate it on three strings in the language and three strings not in the language.

   (a) Submit your NFA (generate a PDF file called Ldiv3.pdf).
   (b) Submit the following writeup in a file Ldiv3.txt:
       i. Mention the three accepted strings you tested on. Describe *one* accepting run in a short paragraph of a few lines (mention which states the NFA went through and why the string was accepted).
       ii. Mention the three rejected strings you tested on. Describe *one* rejecting run in a short paragraph of a few lines (mention which states the NFA went through and why the string was not accepted).
   (c) Submit a screen-shot of the acceptance described above in file Ldiv3AccSS.pdf. I think you can generate screen-shots using a `print` command and choosing a file to save the result in.
   (d) Submit a screen-shot of the rejection described above in file Ldiv3RejSS.pdf.

2. **15%** Draw the NFA for $L_{ends1011}$ in JFLAP. Submit the same kind of files and descriptions as in the previous problem. Call your files Lends1011.pdf, Lends1011.txt, Lends1011AccSS.pdf, and Lends1011RejSS.pdf

3. **20%** Draw the NFA for L_{cat1}. Experiment as above, submitting similar descriptions. Use file names Lcat1.pdf, Lcat1.txt, Lcat1AccSS.pdf, and Lcat1RejSS.pdf

4. **20%** Draw the NFA for L_{union1}. Experiment as above, submitting similar descriptions. Use file names Lunion1.pdf, Lunion1.txt, Lunion1AccSS.pdf, and Lunion1RejSS.pdf

5. **15%** Draw the NFA for the language "second-last symbol is a 1" as discussed in class (the set of strings over $\{0,1\}^*$ such that the second-last symbol is a 1). Submit files L1xxnfa.pdf, L1xxnfa.txt, L1xxnfaAccSS.pdf, and L1xxnfaRejSS.pdf

6. **15%** Draw the DFA for the language "second-last symbol is a 1" as discussed in class (the set of strings over $\{0,1\}^*$ such that the second-last symbol is a 1). Recall the tree-like construction I showed you. Finish that tree. Submit files L1xxdfa.pdf, L1xxdfa.txt, L1xxdfaAccSS.pdf, and L1xxdfaRejSS.pdf