

The midterm will be Friday, May 9th in class. It will be 50 minutes in length and will be closed book. The midterm will cover everything covered in class up to and including the first half of the class on May 2nd. Context-free grammars will not be included. In other words, the midterm will cover Chapter 1 of Sipser and the lecture notes on Myhill-Nerode, pattern matching, and minimizing DFAs. Here is a handy dandy list of topics you should prepare yourself for:

1. Strings and languages. Operations on languages.
2. Deterministic finite automata: formal definition, state diagrams,  $\delta^*$ , the language of a DFA
3. Nondeterministic finite automata: formal definition, state diagrams,  $\varepsilon$  transitions, the language of a NFA
4. Converting NFAs to DFAs by the subset construction
5. Closure properties of regular operations (complement, intersection, union, star, etc)
6. Regular expressions and their languages
7. Construction of a regular expression representing the language accepted by an NFA
8. Construction of a NFA which recognizes the language of a regular expression
9. The pumping lemma. Proving that a language is not regular using the pumping lemma.
10. Pattern matching via a finite automata.
11. The Myhill-Nerode theorem and the equivalence relation  $\equiv_L$  for a language  $L$ . How to prove a language not regular using the Myhill-Nerode theorem.
12. Minimization of DFAs.

Sample midterms are available on the website. A review session will be held on Wednesday, May 7 from 5:30 to 7:30 in EEB 037.