University of Washington

CSE 322: Introduction to Formal Models in Computer Science

Midterm 1 Review

Midterm 1: Monday, April 29, 2002, 10:30am

Spring 2002 April 22, 2002

Here's a list of things you should know about for Midterm 1 on Monday, April 29. The test will cover Chapter 1 in Sipser (and anything from Chapter 0 needed in Chapter 1).

- Strings, alphabets, and languages (Chapter 0)
- DFAs (Section 1.1): Definition of a DFA. Given a language, construct a DFA that accepts that language.
- NFAs (Section 1.2): Definition of a NFA. Why are NFAs interesting? Given a language, construct an NFA that accepts that language.
- Converting NFAs to DFAs (Theorem 1.19): Understand and know how to do the subset construction.
- Regular expressions (Section 1.3): Definition of a regular expression. The language a regular expression represents. Given a language, construct a regular expression that represents that language.
- Closure properties of DFAs and NFAs (Theorems 1.22, 1.23, and 1.24): Know what they are and how to use them to prove new languages are regular.
- Regular expressions represent regular languages (Theorem 1.28, Lemmas 1.29 and 1.32): Know how to do the conversions (regular expression to NFA, and DFA to regular expression).
- The Pumping Lemma (Section 1.4): Understand how the proof goes. Understand why it is important. (You don't need to know how to use it to prove languages are not regular – Homework #4 will ask you to do that.)

Some tips:

- Make sure you know and understand all of the definitions of the various objects we have encountered so far.
- To get more practice, do some (or all) of the suggested exercises from the homework assignments.
- Take a look at the homework solutions that have been handed out.
- You might find it helpful to solve some problems (for example, the suggested problems) in a small group for a little while to get more practice.
- To do well on the exam, you must understand the concepts, not just mimic what we have done so far in lecture and on the homework.