

University of Washington  
CSE 322: Introduction to Formal Models in Computer Science  
Final Exam Review  
Final Exam: Monday, June 10, 2002, 10:30am

Spring 2002

May 31 2002

Here's a list of things you should know about for Final Exam on Monday, June 10. The test will cover the entire course, although there will be a greater emphasis on the material after Midterm 2. However, you will need to know everything we learned in Chapters 0, 1, 2, and 3.

- Chomsky normal form (pages 98-101): Understand the definition. Understand how to convert a context-free grammar into Chomsky normal form.
- The Pumping Lemma for context-free languages (Section 2.3): Understand the proof. Understand why it is important. Understand how to use it to prove languages are not context-free.
- Turing machines (Section 3.1): Definition of a Turing machine. Given a language, construct a Turing machine that recognizes that language. Given a Turing machine, determine what language it generates.
- Variants of Turing machines (Section 3.2): Multitape TMs. Nondeterministic TMs. How to simulate them with (ordinary) Turing machines.

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.

Look (again) at the list of languages on the Midterm 2 review sheet. Construct Turing machines that recognize them. Which ones are Turing-decidable and which are not? For those that are not context-free, prove they are not context-free (either by direct use of the pumping lemma or by using the closure under intersection with regular languages).