

CS 420 Study Guide for Final

The final exam will cover the entire semester. This means Chapter 1, Chapter 2, Chapter 3, Chapter 4, Chapter 5, Sections 1 and 3, and Chapter 7, Sections 1, 2, 3, and 4 (only parts covered in class). The final will be open book and open notes.

The study guides for the two tests still apply. Of course, if I have asked you a type of question on one of the first two tests, that makes it less likely, but not impossible, that I will ask you the same type of question on the final. (This is particularly true for routine questions.)

Here is a list of possible types of questions for Chapter 7, divided into routine and non-routine ones. As before, not all of these types of questions will appear on the test and there will probably be questions not of any of the types listed below, but this does give you a starting point for your studies. For each type of question, I have listed the homework problems you have had of that type.

Routine Question

1. Show some property of O notation.
Exercise 7.1.
2. Apply the algorithm that shows that a context-free language is in P to a particular grammar and string.
Exercise 7.4.

Non-Routine Questions

1. Describe at the implementation level a Turing machine to decide a problem and analyze the running time of the Turing machine.
Supplemental Homework, Exercise 12.
2. Show that a problem is in P by describing a polynomial-time algorithm to decide the problem.
Exercises 7.8, 7.9, 7.10.
3. Show that a problem is in NP by giving a polynomial-time verifier or a polynomial-time nondeterministic Turing machine to decide the problem.
Exercise 7.12.
4. Show the closure of P or NP under some operation.
Exercises 7.6, 7.7, Problem 7.15.