What We Need to Know for the Class Test

Thursday 2nd of November, 2017

Chapters

Course really starts in chapter 3.

3

Need to know the relationships between average case and worst case time.

- properties of comparison-based algorithms
- lower bounds on comparison-based sorting
    - proof for worst case but not average case
    - but need to know Jensen's inequality and Kraft (in)equality
    - proof of Kraft inequality
    - entropy lower bound on compressibility (entropy, etc.)

4

- basic function concepts
- finite sequences and how they're like functions
- power notation for sets of functions
- infinite binary sequences

5

- countable sets, why the set of infinite binary subsequences is uncountable
- binary sequences encoding power sets

6

- definition of computable (existence of a program with the desired input-output function)
- Gödel encoding
- injection and surjection individually to N enough to give countability
- existence of non-computable functions
    - very important
- didn't do infinite exponentials

7

- have covered the whole chapter
- primarily focus on the exercises we've done in tutorials and etc.
- halting problem and realtime programming languages

8

- definition and properties for comparison-based algorithms
- binary comparison paths
- proof for completeness and reduction

9

- analyse code for number of steps
- look at overview of timing measures, it's useful
- haven't done library of babel

10

- comparison time
- timing modularity
- constant and non-constant time algorithms
- why modularity is important for predictability

11

- lower bounds
- how to produce decision tree for a comparison-based sorting algorithm
- don't have to reproduce linear sorting algorithm for

12 & 13

- skip

14

- will cover entropy today or so

17: appendix

- don't need hockey stick but need other three