Review for the Final Exam

Andreas Klappenecker

Topics

- The final exam is comprehensive.
- Emphasis is on topics after the midterm, but all topics covered in class are fair game.
- The idea is that you demonstrate mastery of the topics.

All Questions Answered...

- The collective set of questions sent to me by students of this class comprise the following set:

- Set of questions: ∅

- Answers: I am glad that everything is crystal clear.

FAQ

- Q: Will X, Y or Z be on the exam?
- A: Perhaps. Likely. Maybe.

FAQ

- Q: Should I read the textbook or is the syllabus enough?
- A: Most definitely the textbook.

Seriously

- The course website contains all the information you might need.
- It provides the lecture notes
- You can review the homework problems (and the explorations)
- Take a look at your quizzes
- You do want to read the textbook

Complexity and Computability Theory

- You should know how to prove that a problem is NP-complete
- Work through the examples that are contained in the book
- You should know about undecidability

Randomized Algorithms

- Know about (indicator) random variables
- Know the randomized algorithms that we discussed in class
- Know the difference between Monte Carlo and Las Vegas algorithms
- Know how to amplify the probability of success by repeatedly applying a randomized algorithm

Graph Algorithms

- Graph algorithms provide a good source of problems where you can illustrate some steps of the algorithm (e.g. Kruskal's minimum spanning tree, Disjkstra's shortest path algorithm).
- You need to understand the basic idea behind each algorithm
- You need to know the runtime complexity and space complexity of the algorithms

Design of Algorithms

You need to know

- the Greedy method (and matroids)
- dynamic programming
- divide-and-conquer (including analysis of recurrences, and examples such as the Fast Fourier Transform)

Algorithms

You need to be able to perform an analysis of the running time.

You need to know the basics of asymptotic notations (Big Oh, Big Omega, Big Theta, little oh, little omega).