Department of Mathematics and Computer Science
University of Southern Denmark, Odense

May 20, 2005
LMF

DM69 — Lecture 17

Problems for May 27

1. Write an EREW algorithm for the list ranking problem.
2. Argue that there is a p-processor EREW algorithm that sorts p numbers in time $O(\log^2 p)$.
3. Problem 27.1-2, 27.1-3, and 27.1-6 in Cormen.
4. Problem 27.2-3 in Cormen.
5. Stephan will present the first topic below: Shortest paths in weighted graphs.

Exam questions

This is the list of main questions.

1. Shortest paths in weighted graphs
2. The maximum (s,t)-flow problem and the minimum (s,t)-flow problem
3. Polynomial algorithms for maximum flows
4. Minimum cost flows
5. Matchings: characterizations and algorithms
6. The primal-dual algorithm for the transportation and the assignment problem
7. The RSA cryptosystem
8. Matroids and the greedy algorithm
9. Matroid intersection and partitioning
10. Scheduling: basic concepts and examples of proofs
11. Parallel algorithms
12. Sorting networks

The exam

You will draw one of the 12 topics from the list above.

After drawing a topic you have 30 minutes for preparation. During this time you can use your books and notes. You can make short notes that will help you to organize your presentation, but that will have no other technical content.

The exam itself will take about 25 minutes. Prepare your presentation so that it takes about 15 minutes. Make sure you cover the most important ideas from your topic, though this may mean that you need to skip some details. Your presentation may be interrupted with questions or cut short to go on to other topics. Towards the end of the 25 minute period, you will also be asked short questions not related to the material you presented.

You are free to speak either Danish or English.

Remember that exercises posed during the semester are part of the curriculum. But you will not be asked about the details of an exercise, only the conclusion or the main idea.

Questions

If you have any questions while studying for the exam, you are welcome to send me an email or drop by my office. However, I will be away June 5 – June 10.

Curriculum

Cormen, Leiserson, Rivest, Stein: *Introduction to Algorithms*.
2. edition, MIT Press, 2001.
Sections 16.1–16.2, 16.4–16.5, 24.1–24.2, 25.1–25.3, 31.6–31.8 and Chapter 27.

Bang-Jensen and Gutin: *Digraphs: Theory, Algorithms and Applications*
Springer-Verlag 2001.
Sections 3.1–3.10, 3.11.1, 3.12.

Papadimitriou and Steiglitz: *Combinatorial Optimization*.
Prentice Hall 1982.
Chapter 10.

Korte and Vygen: *Combinatorial Optimization. Theory and Algorithms*.
Springer-Verlag 2000.
Sections 13.5–13.6.

Atallah, editor: *Algorithms and Theory of Computation Handbook*
CRC Press 1999.
Sections 35.1–35.4 and 47.1–47.5.

All exercises posed on weekly notes.

Instruktorater

Hjælp dine medstuderende, dygtiggør dig selv og få penge for det. Søg! Der er normalt relativt få ansøgere, så det er ofte muligt at få et instruktorat, selv om man ikke er langt i studiet. Hvis du har spørgsmål, så henvend dig gerne på IMADA. Ansøgningsproceduren er beskrevet på det officielle opslag, der kan findes via www.jobs.sdu.dk 14 dage inden ansøgningsfristen. Hvis du allerede er ansat som instruktor i efteråret 2005, leverer du ansøgning om tildeling af timer ind på IMADA's sekretariat (se opslag på gangene). Ansøgningsfrist: 9. juni 2005 kl. 12:00.