Institut for Matematik & Datalogi
Syddansk Universitet

May 9, 2003
JBJ

DM69 — Weekly note 13

Pensum for the course

- All exercises posed on weekly notes.
- Handwritten notes by Toft and Bang-Jensen on the primal-dual algorithm for the transportation problem.
- Handwritten notes by Toft and Bang-Jensen on Edmonds' matching algorithm.
- Bang-Jensen and Gutin, Digraphs: Theory, Algorithms and Applications, Springer Verlag London 2001. Chapter 3.
- Papadimitriou and Steiglitz, Combinatorial Optimization, Prentice Hall 1982, Chapter 10.
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- Cormen, Leiserson, Rivest, Introduction to Algorithms first edition Chapter 30.
- Cormen, Leiserson, Rivest and Stein, Introduction to Algorithms, 2nd edition MIT Press 2001: Chapters 16.1-16.2, 16.4-16.5, 24.1-24.2, 25, 27, 30.
- Atalah editor: Algorithms and Theory of Computation handbook, CRC press 1998, Chapters 35 (pages 1-19) and 47.
- Korte and Vygen, Combinatorial Optimization, Chapter 13.
- Kozen, The design and analysis of algorithms, Springer Verlag 1991, Chapters 26 and 27.

Plan for exam

The exam is in U49B and U49E on June 11. The exam starts at 9.00 and the first one (Henrik) draws at 8.30. You should all arrive early in case one of you is ill. You will have 20 minutes for the main question and then we will spend the remaining 10 minutes on questions in other parts of the pensum.

We will examinate in the following order:

- Henrik Berg Nielsen
- Troels Range
- Simon Sune Nielsen
- Paul Medvedev
- Jacob Allerelli

Exam questions

Note that I changed the titles slightly!.

The following are the possible main questions (hovedspørgsmål). You should be prepared to be asked also in the other parts of the stuff we covered.

1. Shortest paths in weighted digraphs.
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. The primal-dual algorithm for the assignment problem and the transportation problem.
6. Matchings: characterizations and algorithms.
7. Matroids and the greedy algorithm.
8. Matroid intersection and matroid partition: algorithms and applications.
9. Scheduling: basic concepts and examples of proofs.
10. PRAM algorithms.
11. Sorting Networks
12. The fast Fourier transform
13. Complexity of counting perfect matchings