

DM19 – Fall06 – Weekly note 15

Talk on Optimization at DSB S-train, January 4, 2007

On Thursday January 4 at 14.15 there will be a talk in the seminarroom by Julie Jespersen Groth (phd student af DTU and DSB sS-train) and Morten Nyhave Nielsen who is a senior analyst at DSB S-train. Julie and Morten will talk on optimization problems occuring at DSB S-train. This talk is highly relevant for those of you who are thinking of writing a master thesis on reallife optimization problems. The title of the talk is “How Operations Research can be used on tenders in the Railway Industry”

Stuff covered December 20, 2006

We continued with online algorithms covered Sections 2 and 8. Only Sections 1,2 and 8 are pensum.

Exam questions

1. Information-theoretic lower bounds (lower bounds proven by counting leaves in decision trees), especially the average case bounds for sorting by comparisons.
2. Adversary arguments – technique, examples.
3. Median problem – algorithm and lower bound.
4. Fibonacci heaps.
5. String matching.
6. Huffman coding.
7. Proof that SATISFIABILITY is NP-complete.
8. NP-completeness proofs – examples.
9. Approximation algorithms for NP-complete problems.
10. Randomized algorithms.
11. Branch and bound.
12. Heuristics.

13. On-line algorithms.

The form of the exam

The exam will be January 24-26. These are the official dates but we will try to use only two days (24+25) until we see the demand for one more day. The sign-up sheets for the order in which students will be examined are already in the secretaries' office. **Sign up well before the exam, preferably before christmas.** Unless the two days are filled up we will not open 26th for exam.

The sign-up list cannot be used to exactly calculate an exam time since some students may not show up. Since, as for all classes, the external examiner is only paid for students who are examined, not for sitting and waiting, if a student is not there, the next student on the list who is present will be taken. When there are no more students ready to be taken, the external examiner may leave, so show up plenty early to make sure you are examined. Two hours before your expected exam time is probably safe enough.

You will draw a topic from the list of topics listed above. You will have 30 minutes to prepare your presentation. During this time you may use the book and your notes. during the exam you may also make short notes (at most 1 page) that will help you to organize your presentation, but that will have no other technical content. At any time the censor and I may ask you to stop using the notes if we feel the use is excessive.

The exam will take about 30 minutes per person. Prepare you presentation so that it takes no more than 20 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 30 minute period, you will typically also be asked short questions not related to the material you talked about.

You may do your presentation in either Danish or English.

Pensum

The pensum listed on the faculty's pensum pages is not correct: All weekly notes and exercises on these is still part of the pensum. Note also that on various weekly notes small corrections to the pensum have been made (always deleting stuff from the pensum).