

DM19 Exam Questions – E04

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 take place on January 3, January 4, and January 5. 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. 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. You may also make short notes that will help you to organize your presentation, but that will have no other technical content. The exam will take about 30 minutes per person. 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 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.