

DM19 – Algorithms and Complexity – E03 – Lecture 4

Lecture, September 15

Paul Medvedev lectured on string matching from chapter 32, covering the first three sections of chapter 32 and the beginning of the fourth. (This will be covered later.)

Lecture, September 22

We will cover section 3.3 and 3.5 of the first set of notes, plus median finding from chapter 9 (sections 9.2 and 9.3) in the textbook.

Lecture, September 29

We will cover amortized analysis from chapter 17 and Fibonacci heaps from chapter 20. We will also finish with the KMP algorithm for string matching.

Studieorienterende samtaler

I lighed med tidligere år afholdes der obligatoriske, studieorienterede samtaler for alle vore studerende på studieretningerne matematik, mat.øk., datalogi, anvendt matematik og datateknologi, som læser på andet studieår og opefter. Samtalerne foretages af lærerrepræsentanter fra både IMADA og MIP i ugerne 39 og 40. Der er tilmeldingslister på sekretariatene.

Problems to be discussed in week 40

- From Baase's textbook: How many comparisons are done by the tournament method to find the second largest item on average if n is a

power of 2?

- From Baase's textbook: Suppose $L1$ and $L2$ are arrays, each with n keys sorted in ascending order.
 - Devise an $O((\lg n)^2)$ algorithm to find the n th smallest of the $2n$ keys. (For simplicity, you may assume the keys are distinct.)
 - Give a lower bound for this problem.
- Design an algorithm for finding the second largest item in array, which is similar to the standard algorithm for finding the largest. Keep track of the largest and second largest at each step. How many comparisons does your algorithm do in the worst case?
- Design an efficient algorithm to find the third largest item in an array.
- Do the following problems from the textbook: 9.3-3, 9.3-7, and 9.3-9.