DM19 – Algorithms and Complexity – E05 – Lecture 3

Lecture, September 14

Radix sort and counting sort from sections 8.2 and 8.3 in the textbook were presented. Then lower bounds from section 2.4 of the first part of the notes were discussed (part of this is also in section 8.1 of the textbook). We also covered section 3.1 and began on section 3.2 of those notes.

Lecture, September 21

We will cover sections 3.2, 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 28

We will cover amortized analysis from chapter 17 and Fibonacci heaps from chapter 20 in the textbook.

Problems to be discussed in week 39

1. 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 nth smallest of the $2n$ keys. (For simplicity, you may assume the keys are distinct.)
   - Give a lower bound for this problem.

2. Design an algorithm for finding the second largest item in an 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?

3. Design an efficient algorithm to find the third largest item in an array.

4. Do the following problems from the textbook: 9.3-3, 9.3-7, and 9.3-9.

Announcement 1

In the period September 26 through October 7, we hold studies advising. It is mandatory for all students (except first year students) to come to this studies advising. You sign up at IMADA's secretaries' office (as soon as possible). Please have your picture taken before the advising by showing up at the department (at "vrkstedet") between 12:00 and 14:00 on September 15, 19, or 22. Note that these dates are all prior to the advising period.

Announcement 2

International Dag på SDU

torsdag den 29. september 2005 på Campustorvet

Information om studie- og praktikophold i udlandet

arrangeret af det internationale kontor ¡http://www.international-office.sdu.dk¿

Announcement 3

Den 27. september 17:30-20:00 i U100 afholdes Venture Cup Kick-Off om start af egen virksomhed. Læs mere på www.venturecup.dk, hvor man også kan tilmelde sig.