Institut for Matematik og Datalogi
Syddansk Universitet

March 4, 2008
JFB

DM508 – Algorithms and Complexity – F08
Lecture 10

Announcement

The exam questions for this year will be the same as last year. See the course's homepage.

Lecture, March 3

We continued with string matching from chapter 32, covering up through the correctness of the KMP algorithm.

Lecture, March 5

We will analyze the running time of the KMP algorithm. We will introduce approximation algorithms from chapter 5, and cover the randomized algorithms for MAX-SAT from the textbook and the notes.

Lecture, March 10

The students will have an opportunity to ask questions. I may present some research on on-line algorithms.

Problems to be discussed on March 11

1. 35.4-1, 35.4-2, 35.4-3.
2. Do problem 7-6 in the textbook. Read both parts of the problem before beginning.
3. Consider the problem of sorting where all the keys are either zero or one. Thus, all records with key value zero should be placed before all records with key value one. Rather than comparison, the fundamental operation will be checking if a key has the value zero or one.
   (a) Use an information theoretic argument to prove a lower bound on the worst case number key checks necessary to solve this problem. Give the best bound you can.

(b) Use an adversary argument to prove a lower bound on the worst case number key checks necessary to solve this problem. Give the best bound you can.

(c) Give an algorithm for this problem. Analyze it, showing that the algorithm uses no more key checks than is necessary in the worst case.