Institut for Matematik og Datalogi
Syddansk Universitet

April 3, 2019
JFB

On-Line Algorithms – F19 – Lecture 13

Lecture, April 3

We covered the definitions for relatedness and weakly comparable in Section 2 and Theorem 7 of Section 5. We began on the k-server problem from sections 10.1, 10.2, and 10.4 of Chapter 10, in the textbook. We got as far as defining the algorithm DC and the potential function for the analysis.

Lecture, April 9

We will finish Section 10.4 and begin on Chapter 12, in the textbook.

Lecture, April 23

We will continue with Chapter 12 in the textbook.

Problems for April 10

1. The problems not finished on April 8. I may lecture if we run out of problems and haven't covered enough in lecture to discuss the problems below.

2. Suppose that GREEDY is allowed n identical machines, while OPT is only allowed to use $m < n$ machines. Give a sequence showing that the ratio of GREEDY's performance to OPT's can be at least $1 + \frac{m-1}{n}$ for the makespan problem. Then show that GREEDY can always achieve this ratio against such a bounded OPT.

3. Consider remark 12.1 on page 208. What is meant here? Why is there no problem if the loads can be greater than 1? (Do not try to prove the desired result for loads of at most 1.)

4. Define POST-GREEDY with release dates as the algorithm which assigns a new job (given at its release date) to the first processor which becomes free. (Jobs have processing times which may be unknown, and only one job may be running on a processor at a time. There are m processors.) Show that POST-GREEDY is $(2 - \frac{1}{m})$-competitive.