On-Line Algorithms – F17 – Lecture 13

Lecture, March 31

We will cover the definitions for relatedness and weakly comparable in section 2 and Theorems 7 and 8 of section 5 in "The relative worst order ratio applied to paging".

Lecture, April 5

We will cover section 7 in "The relative worst order ratio applied to paging". Then, we will cover sections 10.1 and 10.4 of chapter 10 in the textbook.

Lecture, April 18

We will begin on chapter 12 in the textbook, possibly covering up through section 12.2.2.

Problems for April 19

1. Define a lazy version of DC on the line.

   (a) Using relative worst order analysis, show that your algorithm, Lazy Double Coverage, is at least as good as Double Coverage (DC) for three points on the line.

   (b) Show that the greedy algorithm, Greedy, is optimal for three points on the line, according to bijective analysis. To do this, for every algorithm, Alg, you need to find a bijection, f, from sequences of length n to sequences of length n, such that for large enough n, for any sequence I of length n, $\mathrm{Greedy}(I) \leq \mathrm{Alg}(f(I))$.

2. Define and analyze a lazy version of DC for paging.

3. Exercise 10.1.

4. (Easy if you know enough about NP-Completeness) Show that the makespan problem for identical machines is NP-hard.