

# DM508 – Algorithms and Complexity – 2012

## Lecture 3

### Lecture, February 1

We covered sections 3.1, 3.2 and 3.3 of the DM508 notes, plus median finding from chapter 9 (section 9.3) in the textbook.

### Lecture, February 6

We will cover the lower bound on median finding from section 3.5 in the DM508 notes. We will begin on NP-completeness, from chapter 34 in the textbook and the section by Papadimitriou and Steiglitz from the course notes.

### Lecture, February 10

We will continue with NP-Completeness, covering more reductions from known NP-Complete problems. We may begin on Cook's Theorem from the section by Papadimitriou and Steiglitz from the course notes.

### Problems to be discussed on February 15

Do problems:

1. Suppose that there is a language  $L$  for which there is an algorithm that accepts any string  $x \in L$  in polynomial time and rejects any  $x \notin L$ , but this algorithm runs in super-polynomial (more than polynomial) time if  $x \notin L$ . Argue that  $L$  can be decided in polynomial time.
2. 34.3-7 (34.3-6 has the definition of complete you need).
3. 34.4-4, 34.4-5, 34.4-6, 34.4-7.
4. 34.5-1, 34.5-2 (for 34.5.2, try a reduction from Vertex Cover, too).