

## DM833 – Weekly Note 5

### Lectures in week 19

#### Monday, May 6

- We will finish Chapter 10, starting with Lemma 10.5
- Exercise 9.1  
Hint: It is sufficient to use three different item sizes.  
If you cannot find a sequence giving a ratio of  $\frac{5}{3}$ , try to find a sequence with just two item sizes giving a ratio of  $\frac{3}{2}$ .
- Exercise 9.2
- Exercise 9.4
- Exercise 9.5  
Where does the proof of Theorem 9.3 fail for this rounding scheme?

#### Tuesday, May 7

No lecture

#### Wednesday, May 8

- Exercise 10.1  
Hint: Consider two cases:  $p_j \leq \text{OPT}/3$  and  $p_j > \text{OPT}/3$ , where  $p_j$  is defined as in the proof of Theorem 10.3.
- Run the PTAS from Chapter 10 with  $\varepsilon = \frac{1}{3}$  on the following instance of scheduling to minimize makespan. There are 4 machines and 6 jobs with processing times 1, 2, 2, 3, 3, 4.
- We will start on the last topic of the course, LP-based Algorithms:  
Chapter 12: Introduction to LP-duality