

## DM833 – Week 15

### Exercises for Friday, April 11

1. Exercise 1.3 (In the 2001 printing of the book, there is a typo in the hint:  $|S|$  should be replaced by  $\lceil |S|/2 \rceil$ .)
2. Assume that you have an algorithm for finding a minimum vertex cover in a graph. Explain how you can use the algorithm for finding a maximum independent set.  
Does this mean that you can use Algorithm 1.2 for approximating a maximum independent set? (Hint: what approximation factor could you obtain?)
3. Although the vertex cover problem is NP-hard for general graphs, there are graph classes that allow for efficient algorithms.  
Design an algorithm that finds an optimal vertex cover for a tree in linear time.