Homework 12 – Due Thursday, December 8, 2016 on Canvas

Please refer to HW guidelines from HW1, course syllabus, and collaboration policy.

Exercises These should not be handed in, but the material they cover may appear on exams:

1. Chapter 8, problem 1.
2. Chapter 8, problem 2.
3. (**Multiple Interval Scheduling**) Chapter 8, problem 14.
4. (**Cycle Cover**) Chapter 8, problem 41(b).

Problems to be handed in

1. (**Carpenter's Ruler**) Consider the decision version of the Carpenter's Ruler problem from homework 6.

   > Given a carpenter's ruler consisting of n line segments of integer length $\ell_1, \ell_2, ..., \ell_n$, decide whether it can be folded into length at most k.

   Prove that this problem is NP-complete. To prove NP-hardness, reduce from Number Partitioning Problem defined as follows:

   > Given a set of n positive integers $x_1, ..., x_n$, decide whether the numbers can be partitioned into two sets S_1 and S_2 with the same sum:
   >
   > $$\sum_{x_i \in S_1} x_i = \sum_{x_i \in S_2} x_i.$$

2. (**Independent Set on a Grid**) KT, Chapter 11, Problem 10.