Algorithms and Data Structures
Jacobs University Bremen
Dr. Florian Rabe

Homework 12
given: 2017-05-10

Homework 12

You have to submit your solutions as announced in the lecture.
Unless mentioned otherwise, all problems are due 2017-05-19, 11:00.
There will be no deadline extensions unless mentioned otherwise in the lecture.

Problem 12.1 *Greedy Algorithms* Points: 10

Using the general structure, implement the greedy algorithm for the scheduling problem from 21.5.3.

Problem 12.2 *Matroids* Points: 6

Prove that the structure used in the scheduling problem (21.5.3) is indeed a matroid.

Problem 12.3 *Dynamic Programming* Points: 10

Using the general structure, implement the dynamic program for the knapsack problem from 22.3.4.

Problem 12.4 *Parallelization* Points: 6

Consider the parallel associative folding algorithm from the notes.
Determine the time complexity $C^k(n)$ for runing it on a list of length n using k machines.