

Homework 5
Computer Science 511
Fall 2009
Due by 5 PM on Friday, November 6

Reading Assignment

Chapter 8 of K & T.

Problem Set

1. (10 points) Exercise 16, page 513.
2. (10 points) Exercise 19, pages 514–515.
3. (10 points) Exercise 38, page 527.
4. (10 points) Exercise 39, page 527.
5. (10 points) Exercise 42, pages 528–529.
6. (10 points) Suppose you are given one machine and a set of n tasks a_1, a_2, \dots, a_n . Each task a_j has a processing time t_j , a profit p_j and a deadline d_j . The machine can only process one job at a time, and task a_j must run uninterruptedly for t_j consecutive time units. If you complete task a_j by its deadline d_j you receive a profit p_j , but if you complete it after its deadline, you receive no profit. As an optimization problem, you are given the processing times, profits, and deadlines for a set of n tasks, and you wish to find a schedule that completes all the tasks and returns the largest amount of profit.
 - (a) State this problem as a decision problem.
 - (b) Show that the decision problem is NP-complete.