

CS 141: Advanced Topics in Algorithms
Spring 2006
Assignment 8b

Assignment Jon and Garret

Due: Tuesday, April 4

1. [10 Points] **Offline Scheduling**

Remember the problem given in class: Given finite jobs $J_1 \dots J_k$, where job $J_i = (r_i, d_i, w_i)$, with r_i being defined as the release time of J_i , d_i the deadline, and w_i the weight of the job.

Each job takes a unit time to complete, and we can only begin a job once it has been released and before the deadline, and the release times and deadlines are given as non-negative integers.

We can only work on one job at a time, so the goal of this problem is to maximize the total weight w_i of all of the jobs completed.

- (a) Devise an offline polynomial-time algorithm that solves this scheduling problem.
- (b) Briefly, prove the correctness of your algorithm.
- (c) Analyze the runtime of your algorithm and show that it is indeed polynomial in the size of the problem instance.