

Homework 3

CS 4104 (Fall 2009)

Assigned on Wednesday, September 16, 2009.

Hardcopy due at the beginning of class on Wednesday, September 23, 2009.

Problem 1 (10 points) Solve exercise 2 in Chapter 4 (page 189) of “Algorithm Design” by Kleinberg and Tardos.

Problem 2 (35 points) Solve exercise 5 in Chapter 4 (pages 190-191) of “Algorithm Design” by Kleinberg and Tardos. Just in case the problem statement is not completely clear, you can assume that the road is the x -axis, that each house lies directly on the road, and that the position of each house is specified by its x -coordinate.

Problem 3 (45 points) Solve exercise 13 in Chapter 4 (pages 194-195) of “Algorithm Design” by Kleinberg and Tardos. *Hint:* One of the key issues in solving this problem is figuring out what measure to sort all the jobs by. For each job i , define this unknown quantity to be q_i . Now try to use one of the techniques we have seen for proving the correctness of greedy algorithms. Working “backwards” from what you need to prove might help you to discover what q_i should be and thereby define the algorithm.