

Homework Assignment 1

CS 330 Discrete Structures
Spring Semester, 2015

Due: Friday, January 23

1. Page 15, problems 32 (b) and (d)
2. Page 155, problem 74 (c)
3. Given an input sequence v_1, v_2, \dots, v_n of yes/no votes, describe an algorithm to determine the *majority* vote. Determine how much time your algorithm takes in the best and worst cases, expressing your answer with the big-theta notation.
4. Page 217, problem 42
5. Page 330, problem 30
6. Bob and Carol are each secretly assigned consecutive positive integers; they each know their own number and that the numbers are consecutive, but they do not know each other's number. They are told to sit in a room with a clock that chimes every hour. They cannot communicate in any way, but are told to wait in the room until they can deduce the other's number and then leave the room at the next chime of the clock. Prove by induction that the person with the smaller number, n , will leave the room after the n th strike of the clock. (*Hint:* Reason as in the “hat problem” of Lecture 3, January 21.)