

CS 365 – Randomized Algorithms

Rajeev Motwani

Assignment #2 (Due **in class** on 11/6/08)

The following problems are drawn from the course text-book. Note that I will use “Problem” to refer to the problems posed at the end of a chapter, and “Exercise” to refer to the exercises contained in the text. Typically, the exercises in the text are easy and you should be able to solve them while reading the chapter.

- 1) [20 points] Solve Exercise 3.1
- 2) [20 points] Solve Problem 3.3.
- 3) [40 points] Solve Problem 3.4.
- 4) [30 points] Solve Problem 3.6.
- 5) [40 points] Solve Problem 3.9.

Food for Thought. Recall the class discussion on the Las Vegas algorithm for AND-OR tree evaluation. My analysis showed that this algorithm has expected cost $n^{0.793}$, which is 3^k where $n = 4^k$. In fact, a slightly more sophisticated analysis can show that this algorithm has expected cost $n^{0.793-c}$, for a small constant c . Prove the correct *upper* bound on the expected running time of the algorithm. (*This problem is not a part of the homework but only to provide you with some entertainment on a slow day!*)

Reading Assignment: I assume you have finished reading Chapters 1 and 2. You should finish reading Chapter 3 before attempting this homework. In Chapter 4, read up to and including Section 4.3. We will not cover Section 4.4 in class, but you may want to skim through this rather interesting but technical material anyway! We will also cover Chapter 11.1 and 11.2 in class, before moving on to Chapter 6.