Problem Set 3

Due: Beginning of class, Thursday, February 4, 1999.

Suggested Reading: Chapter 6 as needed , 13.4, 14–15.

Problem 3-1. Exercise 6.5–1

Problem 3-2. Do Problem 6–2 on page 133.

Problem 3-3. On the last problem, when you analyzed the MAX program, you saw that the expected total number of times the value *max* gets updated (line 5 in the code from problem 6–2 on page 133) is $\Theta(\lg n)$. Specifically, you showed $\mathrm{E}[s] = \Theta(\lg n)$, where s is the random variable counting the total number of times line 5 gets executed. Now, we wish to show that $s = O(\lg n)$ with high probability. In particular, show that

$$\Pr\{s > c \ln n\} \leq \frac{1}{n^{c-1}}$$

for any constant c that is sufficiently (though not very) large.

Problem 3-4. Do Exercise 13.4–3 on page 259.

Problem 3-5. Do exercise 14.2–5 on page 267.