University of Washington January 5, 2000
Department of Computer Science and Engineering
CSE 521, Winter 2000

Homework 1, **Due Wednesday, January 12, 2000**

Background reading Chapters 1-13, (pages 1-253). I will be assuming that you have seen most of the stuff in the first 13 chapters. If this is not true, let me know.

Reading The first topics in the course will be divide and conquer and dynamic programming. Divide and conquer is not covered in one place in the text - sections from Chapters 4, 10, 31, and 35 will be covered. Read chapter 16 for dynamic programming.

Problem 1:

CLR, Page 37, Exercise 2.2-5 and Exercise 2.2-6.

Problem 2:

CLR, Page 38, Problem 2-3 a.

Problem 3:

CLR, Page 72, Problem 4-1 b, d, f, g, h.

Problem 4:

CLR, Page 169, Problem 8.3.

Problem 5:

CLR, Page 184, Problem 9-2.

Problem 6:

Implement the randomized algorithm for finding the k-th largest element in a set. Let C_{kn} be the expected number of comparisons needed to find the k-th largest element. Experimentally determine $C_{\frac{n}{2}n}$, the number of comparisons needed to determine the median. How quickly does $C_{\frac{n}{2}n}/n$ converge to a constant as n gets large? For a suitably large value of n, what is the behaviour of C_{kn}/n as a function of k?

Problem 7:

CLR, Page 745, Exercise 31.2-6.