CS140: Algorithms

Fall 2000

Assignment 1

This assignment is due at the beginning of class on Wednesday, Sept. 6, 2000. You may collaborate with your classmates to complete this assignment but you must cite your collaborators. In addition, you must write your solutions independently of others. This assignment is worth 100 points (90 points if hand-written). In each of the following problems f, g and h are strictly-increasing, positive-valued functions on the natural numbers.

1. State whether each of the following is true or false.
   (a) If $f(n) = O(g(n))$ then $lim_{n \to \infty} f(n)/g(n) = c$ for some constant c.
   (b) $f(n) = O(g(n))$ if and only if $g(n) = \Omega(f(n))$.
   (c) If $f(n) = o(g(n))$ then $f(n) = O(g(n))$.
   (d) If $f(n) = O(g(n))$ then $f(n) = o(g(n))$.
2. Problem 2-2 on page 38 of the text.
3. Problem 2-3 on page 39 of the text.