CS-140: Algorithms
Fall 1999
Assignment 1
Assigned Wed., Sept. 8, 1999
Due Wed., Sept. 15, 1999

1. Problem 2-2, page 38 of Cormen, Leiserson, Rivest.
2. Problem 2-3(a), page 38 of Cormen, Leiserson, Rivest. (Note: You can make this problem a lot of work if you try, but it is not necessary.)
3. Let f, r, g, s be positive-valued, monotonically-increasing functions on the natural numbers. For each of the following statements, prove the claim is true or give a counter-example.
   (a) If $f(n) = O(r(n))$ and $g(n) = O(s(n))$ then $f(n) \cdot g(n) = O(r(n) \cdot s(n))$.
   (b) If $f(n) = O(r(n))$ and $g(n) = O(s(n))$ then $\frac{f(n)}{g(n)} = O(\frac{r(n)}{s(n)})$.
   (c) If $f(n) = O(g(n))$ then $lim_{n\to\infty}\frac{f(n)}{g(n)}$ is some constant.

BONUS: Problem 2-3(b), page 39 of Cormen, Leiserson, Rivest.