Fall 1996 **CMSC 251: Homework 1** Samir Khuller

Due in class: Sep 17.

Please read Chapter 1 and Chapter 2.1 (until page 31).

(1) Problem 1.1-3 (page 5). Assume that the time to perform a comparison is c_1 time units, the time to do an assignment is c_2 time units, and the time for arithmetic operations (additions/subtractions) is c_3 time units. What is the worst case running time of this algorithm?

(2) Problem 1.2-1 (page 10).

(3) Problem 1-3 (a) – (c) (page 18).

(4) For each of the following pairs of functions $f(n), g(n)$ prove that $g(n) \in O(f(n))$ by explicitly finding the relevant c and n_0.

(a) $g(n) = 6n^2 + 7n + 8$, $f(n) = n^2$.

(b) $g(n) = 5n^3 + 8n$, $f(n) = n^4$.

(c) $g(n) = 10n^{10} + 9n^9 + 8n^8 + 7n^7 + 6n^6 + 5n^5 + 4n^4 + 3n^3 + 2n^2 + n$, $f(n) = n^{10}$.