Assignment #1:
Due September 2

1. Which pairs of statements of the type $f(n) = A(g(n))$ are compatible/incompatible? Here $A \in \{\Theta, \Omega, O, \omega, o\}$
2. Does the statement $[f(n) = O(g(n))]$ imply the statement $[2^{f(n)} = O(2^{g(n)})]$? Is the converse true? Give proofs.
3. Let $f(n) = n^{\log_b a}.(\lg n)^k; b > 1; a \geq 1$. Which of the following statements are true:
   (a) $f(n) = O(n^{\log_b a - \epsilon})$ for some $\epsilon > 0$
   (b) $f(n) = \Theta(n^{\log_b a})$
   (c) $f(n) = \Omega(n^{\log_b a + \epsilon})$ for some $\epsilon > 0$
4. Exercises 3.1-4 (page 50);3.2-4
5. Problems: 3-1; 3-2 (pages 57-58). Show all work justifying your answers.