You will find this Homework posted in the webbook: 
http://www.cs.odu.edu/~webbook
Successively click on CS281 Class Information, and HomeWork. Since I am making up these 
problems, there could be corrections or clarifications during the week; I will post these here as well.

Recall that you are permitted to discuss the material in the text book and the lectures with 
other students, but that you are not permitted to discuss the solutions of Home Work problems 
with others or copy their solutions. You are also responsible for ensuring that other students do 
not copy your solutions.

1. Rosen, read Appendix 1 on logarithms before solving this problem:
   (a) Calculate the values of the following logarithms: \( \log_2 16; \log_2 1; \log_2(1/16); \log_4 64 \).
   (b) Calculate: \( 4^3 \cdot 4^{-2}; 4^1/4^{-2}; (4^2)^{-2} \).

2. Determine whether each of the following functions is \( O(x^3) \). You must show witnesses \( C \) and 
   \( n_0 \) for each problem.
   (a) \( x^2 \log_2(2x) \)
   (b) \( 4^x \)
   (c) \( (\log_2 x)^3 \)
   (d) \( \lfloor x \rfloor \cdot \lceil x \rceil \)

3. Read Section 2.2 (and the description of the Linear Search algorithm in Section 2.1) before 
doing this problem.
Consider the Linear Search algorithm on page 101 of the textbook. Count each comparison 
and each assignment in this algorithm as an operation. (The textbook counts only the 
comparisons.) What is the maximum number of operations that this algorithm could require 
to find an element \( x \) from a list of \( n \) integers \( a_1, a_2, \ldots, a_n \). Give as accurate an answer as 
possible, and do not use the Big-Oh notation.