CS21 Spring 2009, Swarthmore College, Practice Quiz 6

1. Suppose you are given a file that consists of a list of integers separated by commas on each line.

   (a) Write a program that reads the file of numbers and builds a dictionary that stores a count of the number of times each number occurs in the file. After the dictionary is constructed, report the number that appears the most often in the file. For this question, assume that there are no ties in frequency and that each number occurs a distinct number of times in the file. For example, if the file contains
   1, 2, 1
   1, 2, 1, 1, 1, 3
   the function should report that 1 is the most frequently occuring value.

   (b) Now suppose that the frequency counts are not unique, and that there may be multiple numbers in the data file that appear the same number of times. Modify you program to report a list of all the maximally occuring numbers. For example, if the file contains
   4
   1, 2, 1, 2, 1, 2
   3, 4, 1
   3, 4, 2
   your function should return [1,2] since those are the most frequently occuring elements.

2. Given a list of n items:

   (a) How long does it take to search for an item using linear search?

   (b) How long does it take to search for an item using binary search, assuming the list is already sorted?

   (c) How long does it take to sort an unsorted list using selection sort?

   (d) How long does it take to sort an unsorted list using insertion sort?

   (e) How long does it take to sort an unsorted list using merge sort?

   (f) When is it better to sort an unsorted list first before searching?

3. Write a function that takes a dictionary as a parameter and returns a list of the dictionary keys in sorted order. You may use python's built-in sort method if needed.