CSE220: SYSTEMS FUNDAMENTALS I

Assignment 3
Due on 30 Oct, by 5PM

Write the code for each problem separately but hand the code for all the problems in a single plain-text file.

1. Write a function, *Sort*, that takes three parameters---an array, the size of the array, and the number of actual elements in the array---reads in some integers, and sorts them:

   void Sort(int a[ ], int n, int m)

   Call the function from *main* to test it; *n* should be greater than *m*, and the elements read should sorted into the first *m* slots of the array.

2. Write a function, *Insert*, that takes the same parameters as in (1) plus an additional integer, *x*, and inserts *x* in the correct position in a sorted array.

   Write test code that first calls Sort to sort the array and then calls Insert to do an insertion.

3. Write a function to find the number of occurrences of integers in an array of ten elements. For example, with the array containing

   8 3 8 5 4 3 4 3 5 9

   the output should be

   8: 2
   3: 3
   5: 2
   4: 2
   9: 1

   Write a *main* to test the function appropriately.

4. Repeat (3), but with code that uses pointers instead of array subscripting (i.e., indexing).

5. Write a function whose arguments and an integer *N* and a matrix (i.e., two-dimensional array), of *N* by *N* integers and whose actions are to transpose the matrix.

   Write a *main* to test the function with a small matrix.