CMPE 50 – Spring 2015, Tarng

Lab #3 – File I/O and Formatting.

For each of the exercises, you need to write an algorithm and pseudo-code, in a comment section of the source code (.cpp). The algorithm and pseudo-code can cover only the key portion of the solution. There is no need to write algorithms for trivial code. Some examples of algorithms are given at the end of this assignment.

Exercise 1 (Progr. Proj. 6.2):
Write a program that takes its input from a file of characters. This file has a single character on each line. So this program is supposed to read each character from the file, storing each char read into a char array. Once the whole file is read, output the array to a new file (can be named as output.txt) modifying all the characters to upper case. Please use file error checking while performing file operations. Sample data files are available from Canvas->Assignment->Lab3 (LabInput3-1.txt).

Exercise 2 (Arrays and File I/O)
(Based on programming project. 7.5)
Write a program that reads in a list of integers into an array with base type int. Provide the facility to either read this array from the keyboard or from a file, at the user's option. If the user chooses file input, the program should request a file name. You may assume that there are fewer than 50 entries in the array. Your program determines how many entries there are. The output is to be a 2-column list. The first column is a list of the distinct array elements; the second column is the count of the number of occurrences of each element. You need to output the result in a file and on the screen.

The list should be *sorted* on entries in the first column, largest to smallest.

Example:
For example, for the input
-3 4 1 1 3 4
the output should be

N	Count
4	2
3	1
1	2
-3	1

Process:
This assignment consists of multiple components.
If you are unsure how to start, you may simplify and do a basic implementation first, and then add the enhancements (of course feel free to do everything at once!):

- Input from the keyboard vs. reading from a file

    - You can start with keyboard input
    - When reading from file, hardcode the file name
    - Ask the user for input (file name)
    - Have the user select which option in the beginning
- Output the two arrays in two columns
    - Output unsorted
    - Sort first, then output (remember, you may use a simple algorithm as selection sort to sort your array)
    - Add formatting (i.e. make columns look nice)
- Method of implementation:
    - First read and print all the elements line by line.
    - Extend the program to count occurrences (You can use an extra array to store the unique digits inside a list. Then compare the individual element from the unique list with the original list to find out the occurrences.) and print using formatting commands

Exercise 3:

Write a program that merges the numbers in two files and writes all the numbers into a third file. Your program takes input from two different files and writes its output to a third file. Each input file contains a list of numbers of type int in sorted order from the smallest to the largest. After the program is run, the output file will contain all the numbers in the two input files in one longer list in sorted order from smallest to largest in the format given below. Your program should define a function that is called with the two input-file streams and the output-file stream as three arguments.
Please use two input files of your choice containing 5 numbers in each file.

Output of the third file: (eg File 1 contains - 10, 33. File 2 contains 50, 60)
10
<set width = 1> 33
<set width = 2> 50
<set width = 3> 60
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