ICS 103, Term 093

Computer Programming in C

HW# 4
Due date: Wednesday, August 18, 2010

Q.1. You are required to write a C program to do the following:

(i) Ask the user to enter an input file name and read it.

(ii) Count the number of occurrences of each of the alphabetic characters in the input file i.e. 'a' to 'z' regardless whether the character is small letter or capital.

(iii) Print the characters in descending order of their occurrence along with their number of occurrences printing only characters with non-zero count.

A sample execution of the program is shown below:

Input file: hw4.txt	*Histogram Display:*
Searching means scanning through a list of items (in an array) to find if a particular one exists. It usually requires the user to specify the target item - the item he wishes to locate. If the target item is found, the item or its location (index) is returned, otherwise, an appropriate message or flag is returned.	Enter the input file name: data.txt e: 34 t: 29 i: 26 r: 22 a: 21 s: 21 n: 15 o: 15 h: 12 u: 9 l: 7 m: 7 g: 7 c: 7 f: 5 p: 5 d: 5 y: 3 w: 2 x: 2 q: 1 Press any key to continue . . .

Q.2. Write a C program that displays the following menu:

1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit

Assume that the entered array will be a two dimensional array of integers and that the maximum number of rows and columns in the array is 15. Implement each of the menu options 1 to 4 as separate functions. Print the array after reversing a row or reversing a column. The menu should continue to be displayed as long as choice 5 is not selected. If a choice other than between 1 and 5 is entered, the statement "Invalid Choice" should be displayed.

A sample execution of the program is shown below:

```
Select a choice:
1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit
1
Enter number of rows: 2
Enter number of columns: 3
Enter 6 integers:
1 2 3
4 5 6
Select a choice:
1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit
3
Enter a row number: 0
  3  2  1
  4  5  6
```

```
Select a choice:
1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit
4
Enter a column number: 1
  3  5  1
  4  2  6
Select a choice:
1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit
6
Invalid Choice
Select a choice:
1. Read Array
2. Print Array
3. Reverse a row
4. Reverse a column
5. Exit
```

Q.3. Write a C program that asks the user to enter a string of characters, str1, and another string of characters, str2. Then the program replaces all occurrences of str2 in str1 by *. Assume that the maximum length of str1 and str2 is 80.

A sample execution of the program is shown below:

```
Enter a string: Khaled Salem Saleh
Enter another string: ale
Updated string: Kh***d S***m S***h
Press any key to continue . . .
```

This homework is to be done by a group of two students. The solution should be well organized and your program should be well documented. Submit a soft copy of your solution in a zip file. Your solution should be submitted in a word file that contains the following items:

- ***i) Your names and IDs***
- ***ii) Homework number***
- ***iii) Problem statement for each question***
- ***iv) Your solution along with the code for each question***
- ***v) Discussion of what worked and what did not work in your programs. Include snapshots that demonstrate the working parts of your programs. If things did not work and you attempted to solve them, mention that and write about the difficulty that you have faced.***

The soft copy should also contain the source code files (i.e. .c) for each question separately.