BCS 230: Foundations of Computer Programming II

CRN 23798, 23322, 20108 Spring 2015

Instructor: Dr. Jie Li

Homework 3 — Tuesday, February10

Due Tuesday, February 17, 11:55PM on Angel

Assignment Goals: To learn to use character arrays (C-strings) in C++

Assignment:

1. Reading assignment: Chapter 8 C-Strings (Character Arrays) part

2. Programming assignment:

Frequency analysis is the study of the frequency of letters in a text, i.e., the number of occurrence of each letter. In this homework you will write a program that will read a line (or lines) of text and output a list of all the letters that occur in the text together with the number of times each letter occurs in the text. End the line with character '#' that serves as a sentinel value or delimiting character.

Use two arrays, one to hold letters and one to hold the frequency of letters. You may assume that the input uses all uppercase letters. For example, the input

```
HELLO, LET'S GO.#
```

Should produce output similar to the following:

```
Letter      Frequency
E               2
G               1
H               1
L               3
O               2
S               1
T               1
```

1) Write a function `findFreq` that takes a character array (c-string) and returns the frequency of each alphabetic letter. It should have a function heading similar to,

```
void findFreq(char text[], char letter[], int frequency[])
```

The character array `letter` is for 26 uppercase letters and int array `frequency` is to store the frequency of letters.

2) Write a function `printFreq` that outputs a list of all the letters that occur in the text and the number of times each letter occurs. The letters should be listed in alphabetic order. The function `printFreq` should have a function heading similar to,

```
void printFreq(char letter[], int frequency[])
```

3) Write a function `setText` that takes a character array and make the following substitutions to the letters:

Change letter 'A' → letter 'J',
letter 'I' → letter 'Q',
letter 'S' → letter 'Z'.

You can call function `findFreq` and `printFreq` when testing function `setText`.

4) The input file `hw3data.txt` is provided to you. Your function `main` should read a C-string from the input file and perform several function calls to above user-defined functions.

Note,

- `cin.get(quote, m, delim)` reads the next `m-1` characters from the standard input stream or reads until delimiting character is encountered, and stores them into `quote`.
- `cin.get(quote, m)` reads the next m-1 characters from the standard input stream or reads until the end of line character and stores them into `quote`.

Please include your name, ID and CRN in your program. Only submit your cpp file. No project or zip file.