

Programming Assignment 2: Vowel Count Using String Operations

Write a C program to perform the following steps:

- 1) Let capacity be the size of a data buffer with initial value 512. Declare a pointer to character "char *buffer;" and dynamically allocate 512 characters as the initial memory space of buffer[].
- 2) Open the input text file Gift_of_Magi.txt and read the file using fgetc() to input the file character by character until reaching the end of file.
 - a. If the input character is an English letter, convert it to uppercase letter and store in buffer[], starting from index 0. When the memory space of buffer[] becomes full, extend the size of buffer 512 bytes more.
 - b. If the input character is not an English letter, ignore it.
- 3) Insert end-of-string '\0' following the last input character. Print the number of input English letters, i.e., the length of string.
- 4) Open an output text file "result.txt" and write the file using fwrite().
- 5) Print the first 800 characters of the input text on the console, 80 characters in a line.
- 6) Count and report the number of one character letter, two contiguous character letters, three contiguous character letters, and four or more contiguous character letters.
- 7) Count and report the number of each occurrence of vowels, 'A', 'E', 'I', 'O', and 'U'. Print the total vowel count.
- 8) Release memory space of buffer[].

In steps 7 and 8, use string functions in library <string.h> and **NOT** to use library <ctype.h>. Use file name **assgn2_DXXXXXXXX.c** for the source code.

Write a report, **report2_DXXXXXXXX.pdf**, to explain how you develop your assignment solution, where **DXXXXXXXX** is your student ID. Homework assignment 2 is due by **23:59 pm, Wednesday, March 27**. Submit two files **assgn2_DXXXXXXXX.c** and **report_DXXXXXXXX.pdf** to **iLearn**.

Program execution example:

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>>>> Total input English characters: 6161.
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>>>> The first 800 characters are:
THEGIFTOTHEMAGIBYOHENRYONEDOLLARANDEIGHTYSEVENCENTSTHATWASALLANDSIXTYCENTSOFITI
NTHESMALLESTPIECESOFMONEYPENNIESPENNISSAVEDONEANDTWOATATIMEBYNEGOTIATINGWITHTHE
MENATTHEMARKETWHOSOLDVEGETABLESANDMEATNEGOTIATINGUNTILONESFACEBURNEDWITHTHESILEN
TKNOWLEDGEOFBEINGPOORTHREETIMESDELLACOUNTEDITONEDOLLARANDEIGHTYSEVENCENTSANDTHEN
EXTDAYWOULDBECHRISTMASTHEREWASCLEARLYNOTHINGTODOBUTSITDOWNANDCRYODELLACRIEDWHIC
HLEDTOTHE THOUGHTTHATLIFEISMADEUPOFLITTLECRIESANDSMILES WITHMORELITTLECRIESTHANSMI
LESDELLAFINISHEDHERCRYINGANDDRIEDHERFACESHESTOODBYTHEWINDOWANDLOOKEDOUTUNHAPPILY
ATAGRAYCATWALKINGALONGAGRAYFENCEINAGRAYBACKYARDTOMORROWWOULDBECHRISTMASDAYANDSHE
HADONLYONEDOLLARANDEIGHTYSEVENCENTSTOBUYHERHUSBANDJIMAGIFTSHEHADBEENSAVINGEVERYP
ENNY SHECOULDFORMONTHSWITHTHISRESULTJIMEARNEDTWENTYDOLLARS A WEEKWHICH DOESNOTGOFARE
*****

>>>> The number of contiguous letter(s) are:
One character: 5691
Two contiguous characters: 232
Three contiguous characters: 2
Four or more contiguous characters: 0
**** Total character counts: 6161
*****

>>>> The number of occurrences of vowels:
Vowel 'A': 501
Vowel 'E': 774
Vowel 'I': 411
Vowel 'O': 471
Vowel 'U': 169
**** Total vowel count: 2326
*****
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