CS 280
Fall 2022
Recitation Assignment 4
September 29, 2022

Due Date: Monday, October 3rd, 2022, 23:59
Total Points: 9

Write a C++ program that reads from a file name specified in the command line as an argument. However, if no file name is provided, the program should print on a new line "NO SPECIFIED INPUT FILE NAME.", and exit. If the file cannot be opened, print on a new line "CANNOT OPEN THE FILE ", followed by the file name, and exit. The program should read from the file lines until the end of file. In case the file is empty, print out on a new line the message "File is empty." and then exit.

The program categorizes words into four groups based on the number of vowel letters (a, e, i, o, u) found in them. Those groups are the words with no vowels, the words with one vowel, the words with two vowels, and the words with three or more vowels. The program should create a simple directory for each group of words using the <map> container. The simple directory for each group maps a word as a key to an integer value for the number of occurrences of that word in the file. The program should print out the total number of words in the file, and the number of words belonging to each group. In addition, the program prints out the lists of words in each group in order.

For example, with an input file of the following contents:

```
3456 + 1025 - 1234 * 45 = ???
4321 > 125 < !!!
278  ## 1025 @

45 / 100 = 0.45 == 45%
```

End of File

The results are as shown below:

```
Number of words in the file: 14
Number of words with no vowels in the file: 11
Number of words with one vowel in the file: 2
Number of words with two vowels in the file: 0
Number of words with three or more vowels in the file: 1

List of Words with no vowels and their number of occurrences:
/: 1
0.45: 1
100: 1
125: 1
4321: 1
45: 1
45%: 1
=: 2
==: 1
>: 1

List of Words with one vowel and their number of occurrences:
if: 1
then: 1

List of Words with three or more vowels and their number of occurrences:
value: 1
```

End of File →

Hints:

1. Include the <map> container. See the recitation class slides for the use of the <map> methods, or refer to the online documentation for <map> at: www.cplusplus.com/reference/map/map/

2. There are 7 test cases. See the descriptions in the Grading Table below. Test cases 1 and 2 are not associated with any input files. While, test cases 3-7 are associated with the input files infile1 to infile5. The expected correct output for the test cases are in the files with ".correct" extension. Download the zipped files for the test cases infile1 to infile5 and the files for the expected correct output with "*.correct" extension from Canvas. Your implementation will be graded based on the expected correct output for each test case. Use the test cases to test your implementation.

3. If you want to look at the input for one of the test cases on Vocareum, use the linux "cat" command. The cases are in the directory $LIB/public/RA_Fall22/RA4. You can, for

example, look at infile3 by saying "cat $LIB/public/ RA_ Fall22/ infile3 ", and you can look at the expected output by saying:
"cat $LIB/public/ RA_ Fall22/infile3.correct".

Submission Guidelines

1. Please name your file as "RAx_firstinitial_lastname.cpp". Where, "firstinitial" and "lastname" refer to your first name initial letter and last name, respectively, and "x" refers to the recitation assignment number (e.g., 1, 2, etc). Your program Submission is to Vocareum environment. Follow the link of Recitation Assignment 2 on Canvas in the Modules or Assignments pages to connect to the current assignment on Vocareum.

2. **Submissions after the due date are accepted with a fixed penalty of 25% from the student's score. No submission is accepted after Wednesday 11:59 pm, October 5, 2022.**

Grading Table

Testing Cases	Points
Case 1: No file name is found (nofile)	0.5
Case 2: File cannot be opened (cantopen)	0.5
Case 3: Empty File (empty)	0.5
Case 4: Blank file (blank or all whitespace)	0.5
Case 5: No vowels text file (novowels)	2.0
Case 6: File containing words with mixed number of vowels (vowels1)	2.0
Case 7: File containing words with mixed number of vowels (vowels2)	2.0
Compiles Successfully	1.0
Total	9