CS 280
Spring 2022
Recitation Assignment 3
September 22, 2022

Due Date: Monday, September 26, 2022, 23:59
Total Points: 10

Write a C++ program that reads from a file lines until the end of file is found. If the input file is empty, it prints out the message "File is empty." on a new line and then exits. The program should count the number of lines, the number of non-blank lines, the total number of words, the number of names, and the number of integers, seen in the file.

A word is defined as a sequence of one or more non-whitespace characters separated by whitespace. A word is defined as a name if it starts by a letter or an underscore '_', and followed by zero or more letters, digits, underscores '_', or '@' characters. For example, `value`, `val@19`, `num234ten`, _num_45 are valid names, but `9val`, and `&num` are not. A word is defined as an integer if it starts by a digit or an optional sign (i.e., '-' or '+') and followed by zero or more digits. For example, 2345, -345, +543 are integer words, while 44.75, and 4today45 are not. Note that a line having only whitespace characters is a blank line as well.

The program should accept one or more command line arguments for a file name and input flags. The notations for the command line arguments are specified as follows:

- The first argument must be a file name.
- -all (optional): If it is present, the program prints the number of integer and name words in the file.
- -ints (optional): If it is present, the program prints the number of integer words only in the file.
- -names (optional): If it is present, the program prints the number of name words only in the file.

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. In case the command line does not include any of the optional flags, the program should print out the total number of lines, the number of non-blank lines, and the total number of words only. If an optional flag argument is not recognized, the program should print out the message "UNRECOGNIZED FLAG".

For example, given an input file “allflag” of the following contents:

Line number	File contents
1	3456 Georgre@ +10 -25, 125
2	
3	1234 smith- boss 4_5 g_45
4	
5	
6	4321 _staci_ class 12.75 -zy
7	
8	278 sandra 25.35 $$ + x2 7y scr.squ njit.
End of File →	

The displayed output for executing the program with the “-all” flag would be as shown below:

```
Total Number of Lines: 8
Number of non-blank lines: 4
Number of Words: 24
Number of Integers: 6
Number of Names: 7
```

Hints:

1. Use <cctype> functions such as: isdigit(), isalpha(), isspace(), isalnum() to check for digit characters, alphabetic characters, whitespace, or alphanumeric characters, respectively.
2. You can use *getline()* method for reading from the input file.
3. Convert the read line from the file into an input string stream, then read words from the input string stream. See the slides for details.
4. Download the zipped file for the test cases from Canvas. These are the test cases you will be graded against on your submission to Vocareum. Use the test cases to test your implementation. There are 9 test cases, see the designation of each case in the grading table below. Case1 is checking whether your program displays a message if there is no provided file name as an argument to your program. Note that case2 is for “cantopen” which does not exist. See the grading table below for descriptions of case3 to case9.
5. If you want to look at the input for one of the test cases, use the linux "cat" command. The cases are in the directory $LIB/public/RA_Fall22/RA3. For example, case 6 file is “intsonly”. You can look at “intsonly” file by using the command "cat $LIB/public/ RA_Fall22/ intsonly", and you can look at the expected output for this case by saying "cat $LIB/public/RA_ Fall22/ intsonly.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 3 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, September 28, 2022.**

Grading Table:

Testing Cases	Points
Case 1: No file name is found	1.0
Case 2: File cannot be opened	1.0
Case 3: Empty File	1.0
Case 4: No flags found	1.0
Case 5: Invalid flag	1.0
Case 6: Integer words flag only	1.0
Case 7: Name words flag only	1.0
Case 8: All flag	1.0
Case 9: No name words	1.0
Compiles Successfully	1.0
Total	10