CS2400 Homework 4 Speeding Violations
40 Points

Objectives:

Use files, searching arrays/vectors, and functions.

Every day a police department generates a file of driver license numbers for speeding violators. The license number consists of two letters (upper or lower case) followed by six digits. The department would like to know how many violations a particular license has.

Write a C++ program that finds the number violations by counting the number of times a driver license number occurs in the data file. The program should start by reading the file name, load the data into an array or a vector of strings, and repeatedly ask for a driver license to determine the number of violations.

Display an error message if the file does not exist or the driver license is invalid (wrong format). See sample interaction below.

The number of violations is equivalent to the number of occurrences a license appears in the file. If the license has 6 or more violations, display a message indicating that the license should be suspended.

A sample data file ("**violations.tx**t") is supplied with your initial repository.

Your program should continuously ask for a driver license to search until the user enters q or Q to quit the program.

Your program must include the following two functions:

- A function that loads all the data into an array/vector of strings.
- A function called **`toUppercase`** that converts all the letters in a license to uppercase letters. The function should return the license with the letters converted to uppercase.
- A function called **`isValid`** that returns true if a license is valid, false otherwise. This function should be called prior to processing the license number.
- A function that searches the array of licenses for a license number and returns the number of occurrences (violations). It should return 0 if the license is not found.
- A function that prints the results.
    - License number and the number of violations
    - Whether the license needs to be suspended or not

Extra Credit (4 points):

- After the user quits, display the number of suspended licenses.

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Hints:

Use `toupper` function to convert a character to uppercase letter.

- Make sure your load function returns the number of licenses read.
- You can access the individual characters in a string using the function `at` or using square brackets as follows:
  `char ch = license.at(0); //`copies the first character in the string license to ch
  `license[0] = 'A'; //`modifies the first character in the string license

Sample interaction:

```
./a.out
Enter the data file name: violations123.txt
Error: File name violations123.txt does not exist

./a.out
Enter the data file name: violations.txt

Enter a license number (Q/q to quit): xz908976
Driver license XZ908976 has 0 violations.

Enter a license number (Q/q to quit): aB432908
Driver license AB432908 has 9 violations.
Driver license AB432908 should be suspended

Enter a license number (Q/q to quit): Xyz120988
Error: Xyz120988 invalid license number

Enter a license number (Q/q to quit): 120988
Error: 120988 invalid license number

Enter a license number (Q/q to quit): AB1234567
Error: AB1234567 invalid license number

Enter a license number (Q/q to quit): AB120Z88
Error: AB120Z88 invalid license number

Enter a license number (Q/q to quit): q
```

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Grading:
Programs that contain syntax errors will earn zero points.
Programs that do not include the above functions will also earn zero points.
Programs that use any library that was not discussed in class will earn zero points.

Your grade will be determine using the following criteria:

- Correctness (35 points)
  - 5 points for each of the required functions listed above.
  - 5 points for running continuously

  - (5 points) Clarity and format of the output including good error messages
- (5 points) Style & Documentation

Follow the coding style outline on GitHub:
https://github.com/nasseef/cs2400/blob/master/docs/coding-style.md