Data Structures (2028C) -- Fall 2019 – **Homework 1**
Topics covered: Working with Files and Structures
Homework due: Thursday, Sept 26 at 6:00PM

Objective:
   The objective of this homework is to create structures, read from, create and write to files using C++.. This assignment will incorporate arrays

Scenario:
   You are a programmer tasked to take the plain text from a series of formatted files and create a library card catalog file and a statistics file.

Requirements:
1. Ask the user for the name of the file to be processed.
2. Attempt to open the file of the given name. If unsuccessful, it should output an error message and prompt the user to enter another file name.
3. With the file open, read into a Structure:
   a. Title
   b. Author full name (the name is stored in the file as First and Last name with a space between)
   c. Word Count (total number of words in the book contents. A word is one or more letters (not counting punctuation) separated by a space so ice cream is considered 2 words)
   d. Letter frequency (this is the number of times each letter has been encountered in the book contents)
   e. Line Count (count of new line characters in the contents section)
4. Save this information in the file CardCatalog.txt
   a. If the file doesn't exist, create it.
   b. If the file does exist, append to it.
   c. Leave a blank line between each card catalog entry.
   d. The file should be human readable such as (is should be similar but not necessarily the same as the following*):
      Title: Moby Dick
      Full Author: Herman Melville
      Author First Name: Herman
      Author Last Name: Melville
      Word count: 375
      Line count: 17
5. Ask the user if they want to see the letter frequency. If they agree, it should look like*:
      Moby Dick letter frequency:
      a: 0.0762%
      b: 0.0 %
      c: 0.0253%
      d: 0.0405%
6. Ask the user if they wish to process another book. If they do, repeat requirement 2. If they don't, program should quit. This should not add to previous results.
(*) *The numbers shown heer are not necessary correct*

Submission:
Submit all source code files and any required data files in a zip file. Include a write up as a PDF including:

- The name of all group members (minimum 2 members, maximum 4 members).
- Instructions for compiling and running the program including any files or folders that must exist.
- What each group member contributed. If the contributions are not equitable, what portion of the grade each group member should receive.

Submission should be submitted via BlackBoard.

Grading:
1. 5% - Requirement 1 works correctly
2. 10% - Requirement 2 works correctly
3. 25% - Requirement 3 works correctly
4. 20% - Requirement 4 works correctly
5. 20% - Requirement 5 works correctly
6. 10% - Requirement 6 works correctly
7. 10% - Code is well formatted, well commented and follows a reasonable style.
   If program fails to compile, the grade will be limited to a max grade of 50%.

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Sample text file: MobyDick.txt

Moby Dick
Herman Melville
Contents:
Call me Ishmael. Some years ago- never mind how long precisely-
having little or no money in my purse, and nothing particular to
interest me on shore, I thought I would sail about a little and see
the watery part of the world. It is a way I have of driving off the
spleen and regulating the circulation. Whenever I find myself growing
grim about the mouth; whenever it is a damp, drizzly November in my
soul; whenever I find myself involuntarily pausing before coffin
warehouses, and bringing up the rear of every funeral I meet; and
especially whenever my hypos get such an upper hand of me, that it
requires a strong moral principle to prevent me from deliberately
stepping into the street, and methodically knocking people's hats
off- then, I account it high time to get to sea as soon as I
can. This is my substitute for pistol and ball. With a philosophical
flourish Cato throws himself upon his sword; I quietly take to the
ship. There is nothing surprising in this. If they but knew it,
almost all men in their degree, some time or other, cherish very
nearly the same feelings towards the ocean with me.