Homework 1
100 Points

Linked Lists

Project: Build and process a sorted linked list. As en entry-level programmer you have to be able to read, understand existing code and update it (add new features). One of this assignment's goals is to read about 500 lines of code (in three files: CountryList.h, CountryList.cpp, Hw1.cpp), compile and run the program, understand it, and change it as required. The existing program does the following:

> A. Reads data from a text file (**countries.txt**) and inserts them into a sorted linked list. The list is to be sorted in ascending order by the country code named **code** (a unique key). The **Country** structure has four fields:
> > **code** (C-string)   such as **FR**
> > **name** (string)   **France**
> > **capital** (string)   **Paris**
> > **population** (int)   **60656178**
>
> B. Prints the list as a table with four columns (header included)
> C. Deletes countries: prompts the user to enter the code of the country to be deleted or QUIT to stop deleting.
>
> D. Searches the list: prompts the user to enter the code of the country or QUIT to stop searching; searches for that country: if found, displays its' data, otherwise displays some message, such as "… Not found"
>
> E. Destroys the list //no memory leak

YOUR TASK is to read and understand this program. Then do the following:
--> Replace the Country structure by a Country class (including setters, getters, etc.)
--> Create and use a sentinel (or dummy) node
   // a sentinel node is an empty data node placed in the beginning of the list
   // insert/delete are shorter, simpler, and more eficient

--> Display the number of countries in the list
--> Delete all countries whose capital contains the letter 'a' or 'A'
--> Display the list again
--> Display the number of countries in the list again

Grading // see next page

Grading:

Create a project consisting of multiple header and source files	- 10
Replace the Country structure by a Country class	- 20
Create and use a sentinel node	- 20
Display the number of countries in the list	- 10
Delete required countries from the list	- 20
Display the list and its count again	- 10
The main() function	- 10

Run the program once and save the output at the end of the source file as a comment. Compress the source and header files, input and output files (if any), and upload the compressed file: 22C_LastName_FirstName_H1.zip