CSCI 2170 Open Lab 2
Due date: midnight, Monday, Sept 14th. Deadline: midnight, Monday Sept 21st

In this open lab assignment, you will write two C++ programs for the following two problems.

Problem 1: Write a C++ program, named **perfect.cpp**, that reads an integer value from the user and determines whether the number is a perfect number or not. A perfect number is such an integer: the sum of all its positive divisors equals to the number itself. For example, number 6 is a perfect number. Its divisors are 1, 2, and 3. The sum of these divisors 1+2+3 equals to the number 6 itself.

Two user-defined functions are required in this program:

- The function "getUserInput" will prompt the user to enter a positive whole number. It keeps prompting the user until a positive whole number is entered. This number is returned to the calling function
- The function "isPerfect" will determine if the number is perfect or not. It returns true if the number if perfect, and false otherwise.

Sample program run 1:

```
Please enter a positive whole number:  -90
Please enter a positive whole number: 0
Please enter a positive whole number: 28

28 is a perfect number.
```

Sample program run 2:

```
Please enter a positive whole number:  90

90 is not a perfect number.
```

Here are some suggestions for developing your program:

- Do not start by writing the entire program.
- Develop your program in steps, for example, break up the program into two parts and do it one by one:
    1. Write a simple main function that only contains the call to function "getUserInput". And write the code for the function "getUserInput".
    2. Use cout statement or use codelite debugger to debug and make sure the function "getUserInput" works correctly
    3. Then, write the "isPerfect" function. Use cout statements and codelite debugger to debug and make sure the function works correctly.
    4. Calls the function "isPerfect" in the main function.
    5. Finalize the program with any other required output.

Problem 2: Write a C++ program named **acronym.cpp.** (You may want to wait until after Thursday's closed lab to work on this problem)

The acronym for a given string is formed by combining the first letters from a series of words, as in this example:

"self contained underwater breathing apparatus" →"SCUBA".

Your program generates and displays the acronyms for each of the strings in a data file named "Acronym.dat". The output of your program should be of the following format:

Self contained underwater breathing apparatus → SCUBA
White anglo saxon protestant → WASP
…
North Atlantic Treaty Organization →NATO

The strings in the data file may have mixed upper and lower letters. You may assume that no hyphen and underscore, and no punctuation marks is present in the data file. The acronyms generated should all be in upper case letters.

Your program is required to have at least one user-define function. This function takes one string as input and returns the acronym corresponding to that string.

Download the data file from the course web page, and place the file in the project directory.
Or, you can copy it into your project directory with command:

cp ~cen/data/Acronym.dat codelite-workspace-name/project-name/

Documentation and program indentation and formatting

- Write the program with indentation and formatting style as discussed in class, and given in the program requirement :
  https://www.cs.mtsu.edu/~cen/2170/private/ola/programrequirements.pdf
- Write documentation for your programs as discussed in class and given in the program requirement.

Electronically submit the two programs in D2L Dropbox. You are only required to submit the two source files: **perfect.cpp** and **acronym.cpp.**