Homework 9: Recursion   **Due Date:** 4/11/23

You have been hired by a coalition of nations to circumvent the security system of an evil cabal! In particular, you need to write a function that uses a brute-force approach to guess all possible passwords of three high-level cabal members: Mr. Mean, Ms. Chief, and Dr. Evil, and two other accounts, Guest and Dave. As you may know, recursion is often helpful in such a situation.

Previous intelligence gathering has determined that all five passwords have length at most 8 and contain only lowercase letters ('a'-'z') and digits ('0'-'9'). The following additional information about each password has also been uncovered:

1. Guest's password is "passw123".
2. Dave's password consists of exactly 4 digits.
3. Mr. Mean's password consists of only the characters 'g' and 'r'.
4. Ms. Chief's password starts with "haha".
5. Dr. Evil's password starts or ends with the string "gato".

Because of the cabal's security system, your function must be able to correctly guess all five passwords in a reasonable amount of time (around 15 seconds).

The following files have been given to you:

1. A C++ header file (evilcomputer.h) declaring the **EvilComputer** class (represents a replica of the cabal's computer system).
2. A C++ source file (evilcomputer.cpp) implementing the EvilComputer class.
3. A C++ header file (hack.h) defining a password hacking function.
4. A C++ source file (main.cpp) containing a main() function with tests.

Create new C++ source file named **hack.cpp** that implements the function declared in hack.h so that hack.cpp and the provided files compile into a program that runs with no failed tests.

Submit just the source code of **hack.cpp**. You don't need to submit the main.cpp nor the other files because I will use my own hack.h, evilcomputer.h, evilcomputer.cpp, and main.cpp files to evaluate your hack.cpp file.

Review the examples discussed in class and the textbook to get an idea of what you need to do. Analyze carefully the tests because that will help you understand how the functions that you need to create work.

Do not hesitate to use the corresponding topic in Discussions to post your questions/doubts about this assignment. I will reply as soon as I can.

IMPORTANT:

Make sure your program compiles and executes in full (it should pass all the tests included in main()).

You must submit ONLY ONE solution per team.

Your program must be well commented, use meaningful identifiers, and use indentation to improve its readability.

        Your program must have the following comments at the top:

```
//***********************************************************************
// Team #            CSCI 2380              Spring 2023            Homework # 9
// First and Last Name
// First and Last Name
//***********************************************************************
```

When done, submit your solution through Blackboard using the "Assignments" tool. Do Not email it.

Paste the link to your solution and the source code of browserhistory.cpp in the textbox corresponding to Text Submission (click on the Write Submission button) before you click on Submit.

The following is the basic criteria to be used to grade your submission:

You start with 100 points and then lose points as you don't do something that is required.

-20   : Incorrect implementation of hack(EvilComputer* es)
-20   : Incorrect implementation of the hacking of the dave account
-20   : Incorrect implementation of the hacking of the mr_mean account
-20   : Incorrect implementation of the hacking of the ms_chief account
-20   : Incorrect implementation of the hacking of the dr_evil account
-20   : Program crashes when executed
-5   : Unnecessary statements in your code
-40   : Program does not compile
-10   : Missing/too few comments
-20   : Incorrect/missing cpp file
-20   : Incorrect/missing link to your Repl.it solution
-100   : No team contribution
-100   : The code submitted is not your creation (you got it from a web site or another person)

-10   : Late
-100   : No submission.

Important: more points may be lost for other reasons not specified here.