Gebze Technical University
Department of Computer Engineering
CSE 241/505
Object Oriented Programming
Fall 2017
Homework # 4
Due date Nov 7th 2017

In this homework, you will re-write your game of Connect Four program in C++ using dynamic memory techniques. You will not use any vectors or constant sized arrays.

Your main class for this homework will be named **`ConnectFour`**. This class will have a private inner class named **`Cell`** to represent a Connect Four cell. The class **`Cell`** will hold the position of the cell (A, B, C, etc) and the row number (1, 2, 3, etc). This class will also include all necessary setters/getters, constructors etc. Remember a cell can be empty, user (user1, user2) or computer. You will overload the following operators for the class cell.

- Operator== to compare two cells
- Pre and post increment/decrement operators for cell. The ++ operator changes the cell state from empty to user1, from user1 to user2, from user2 to computer, from computer back to empty.
- Stream insertion and extraction operators for cell.

Next, write a class named **`ConnectFour`** to represent and play the game. The class C**`onnectFour`** will hold a **`Cell ** gameBoard`** data member to represent the game board as a two dimensional dynamic array.

The class **`ConnectFour`** will also have the following features and functions

- There is no limit for the board. Your game will resize according to the parameter for the constructor.
- There should be at least 3 constructors.
    - The no parameter constructor creates a 5x5 game
    - Another contructor takes number of rows and columns as parameters
    - Another constructor takes a text file as a parameter. This text file will contain the board shape marked with * characters. For example, the following is a board configuration: it has 7 rows and 17 columns. Some of the columns are shorter than the others.

```
   ***
  *****
 *******
*********
 ***********
  ***************
*****************
```

- The class will have functions to read and write from files. You will decide on the file format.
- The class will have functions to print the current configuration of the board to the screen.

- The class will have two functions named play that plays the game for a single time step. First function does not take a parameter and it plays the computer. The second function takes a cell position and it plays the user.
- The class should have a function that returns if the game ended.
- The class should have a function named playGame. This function plays the game by asking the user the board file name first then asks the user to play and the computer plays, etc.

- The class will overload operator== and operator !=
- Any other functions (public or private) needed.

Write your main function to test both classes. Make at least 5 objects of class **`ConnectFour`** and play the games at the same time.
You will use all the object oriented techniques that we learned in the class including **`const, static, inline`** keywords.

Notes:

- Do not use any functions from the standard C library (like **`printf`**)
- Read the chapter about file input output for reading and writing text files using streams.
- Do not use anything that we did not learn in the lectures.
- Do not forget to indent your code and provide comments.
- Check the validity of the user input.
- **Test your programs very carefully several different runs. Submit at least two saved files with your HW.**
- **Submit at least 3 sample board configuration files.**
- You should submit your work to the moodle page.