Gebze Technical University
Department of Computer Engineering
CSE 241/505
Object Oriented Programming
Fall 2021
Homework # 3
Due date Nov 6th 2021

In this homework, you will write your game of Peg Solitaire program in C++ using object oriented techniques. Your main class for this homework will be named **`PegSolitaire`**. This class will have a public inner class named **`Cell`** to represent a Peg Solitaire 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 or contains a peg (P), which will be represented by C++11 enum types.

Write a class named **`PegSolitaire`** to represent and play the game. The class **`PegSolitaire`** will hold a 2D vector of vector of **`Cell`** objects to represent the cells in its private section.

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

- There is no limit for the board but it should be larger than 5x5 and it should be square. Your game will resize according to the parameter for the constructor.
- There should be at least 3 constructors. One of the constructors will accept the board type (an int from 1 to 6 as shown in HW1)
- The class will have functions to read from and write to files. You will decide on the file format like you did in HW2.
- The class will have functions to return the number of pegs, number of empty cells, and number of pegs taken out from the board.
- The class will have a function that displays the current board on the screen
- The class will have two functions named **play** that plays the game for a single step. First function does not take a parameter and it plays automatically. 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 type first then automatically plays the game until it ends. The boards should be printed to the screen.
- The class will have a static function that returns the total number of pegs in all the game boards. Be careful here because there could be more than one game active at the same time.
- The class will have a function that takes another object **`PegSolitaire`** as parameter and compares the Peg Solitaire games. It returns true is the first game has more pegs, otherwise it returns false.
- Any other functions (public or private) needed.

Write your main function to test both classes. Make at least 5 objects of class **`PegSolitaire`** 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 at least with 10 different runs. Submit at least two saved files with the HW.**
- You should submit your work to the Teams page.