CS 3331: Advanced Object-Oriented Programming

HOMEWORK 1a: Warm-up -- Connect Five

Due:

This assignment must be done individually.

In this course, you will be developing a series of Java applications to play Connect Five. You will start with a simple, console-based application and will refine it in several iterations to an ultimate, network version.

Connect Five is a simple two-player game. The goal of the game is to beat your opponent on setting a continuous line of discs vertically, horizontally or diagonally. Our game is based on the classic Connect Four game where discs are dropped into vertically placed board. The main difference on our implementation is that the disc are placed on any valid position on a flat horizontally placed board.
The dimensions of the board are 15x15.

```
-----------------------------------------------------------------
Player 1, please enter you next move (x y) or -1 to quit:
5 9

y\x   1   2   3   4   5   6   7   8   9   10  11  12  13  14  15
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
1       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
2       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
3       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
4       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
5       |   |   |   |   |   |   |   |   |   | â—□ |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
6       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
7       |   |   |   |   | â—‹ |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
8       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
9       |   |   |   |   | â—□ |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
10      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
11      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
12      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
13      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
14      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
15      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
        +---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

Player 2, please enter you next move (x y) or -1 to quit:
```

1. Write a console-based Java application to play a simplified version of Connect Five, where a game starts with an empty grid. Your application has to meet the following functional and non-functional requirements:

   R1. The application shall support a 15x15 grid.

   R2. The application shall show the progress of the game by displaying the current configuration of the game -- all the numbers placed in the grid. Consider using 2-D ASCII drawing to display the grid (see R6 below).

   R3. The application shall detect and prevent the user from placing an invalid or inconsistent number in the grid. A number is invalid if it is outside the range (1-15). It is inconsistent (or conflicting) if it is already placed in the same column and row as an existing disc.

   R4. The application shall detect and congratulate it when the user completes solving the puzzle.

   R5. The application shall provide a way for the user to quit the game, e.g., using a special input value (see R6 below).

   R6. The application shall take all user inputs from System.in and display all outputs to System.out.

TESTING

Your code should compile and run correctly with Java 8 or later versions.

WHAT AND HOW TO TURN IN

Submit your program through blackboard attaching a single zip file. Your zip file should include only a single directory named YourFirstNameLastName containing: (a) a runnable jar file and b) source code files and other support files if any.
DO NOT INCLUDE BYTECODE (.class) FILES.
There is a limit on upload file size and the maximum file size is 2MB. You should turn in your programs by 11:59 pm on the due date.

GRADING

You will be graded in part on the quality of the design and on how clear your code is. Excessively long code will be penalized: don't repeat code in multiple places. Your code should be reasonably documented and sensibly indented so it is easy to read and understand.

Be sure your name is in the comments in your code.