Assignment 1 - Classes, Two-Dimensional Arrays & ArrayLists

Battleship is a two-player guessing game in which you search for your opponent's ships and eliminate them one-by-one. If you've never played before, give this a try: http://www.battleshiponline.org.

In our simple version of the game, the user will compete against the computer to sink the computer's randomly placed battleship(s). Each battleship will only take up one cell. Open water is indicated by an O, incorrect guesses by an X, and battleships by an asterisk (*).

Task

First, make a class to store the location of your battleships.

1. Create a class named `Location` with only 2 attributes, `row` and `column`.
   - Add getters and setters for both attributes and
   - a constructor that accepts the row and column values as arguments and assigns them appropriately

Then, add a driver class (either in the same file or separately) to "drive" your game. In this class:

2. Build your game board. This is a 5 x 5 two-dimensional `char` array.
   - Initialize the board to store O's (capital letter o) for the open water.
   - Print the board, it should look a little something like Figure 1.

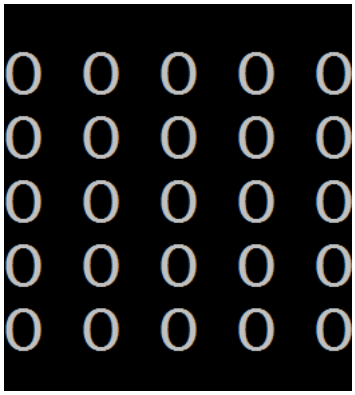

Figure 1: Empty Battleship Board

3. Create an `ArrayList` capable of storing `Location` objects (see step 1).
4. Using an object of the `Random` class, generate random row and column values for 3 battle ships. Create corresponding `Location` objects and append these objects to the `ArrayList`.
5. The user gets 4 attempts to guess where your battleships are. For each attempt, do the following:
   (a) Tell them how many attempts remain
   (b) Tell them how many battleships remain
   (c) Allow the user to make a guess, then:
      i. Check their guess against the boundaries of the board, if it is outside of the boundaries, display an appropriate message (see Figure 2)

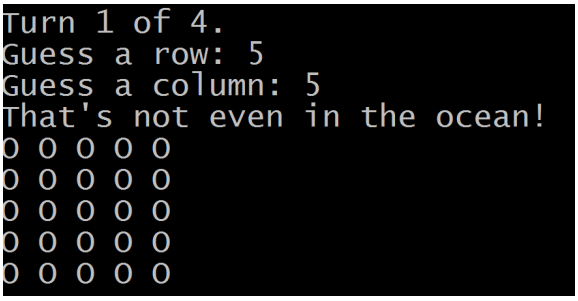

Figure 2: An out-of-bounds Guess

ii. Check the guess against cells already marked with an asterisk (indicating a battleship) or an X (indicating a miss), display a message to tell the user that they've already guessed that location (see Figure 3)

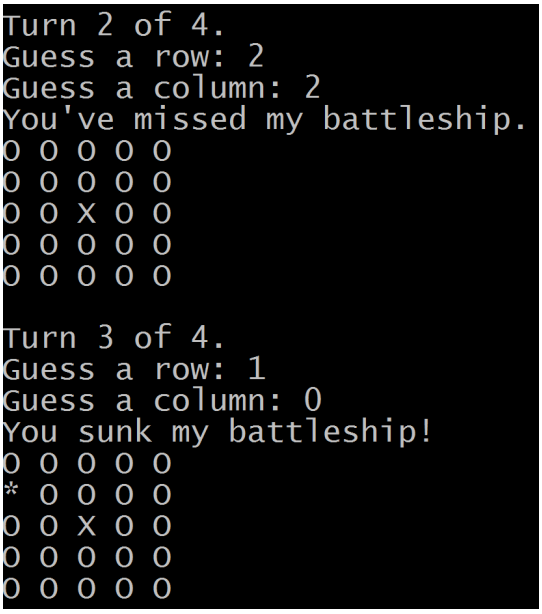

Figure 3: Guessing Locations (note the **X** and *)

iii. Check the guess against all battleship locations in the `ArrayList`. If they guess correctly:

- Remove that location from the `ArrayList`
- Mark the location on the board with an asterisk
- Display an appropriate message

iv. Otherwise, mark the guessed location with an X and display a message telling the user they have missed your battleship

(d) Print the board

(e) Decrement the number of turns

After all guesses have been made, if there are still battleships remaining, mark all of them on the board with an asterisk, display a message stating the game is over and reprint the board (see Figure 4).

Test your game! Make sure correct and incorrect guesses work appropriately according to the above instructions.

Take a screenshot of your successful game play.

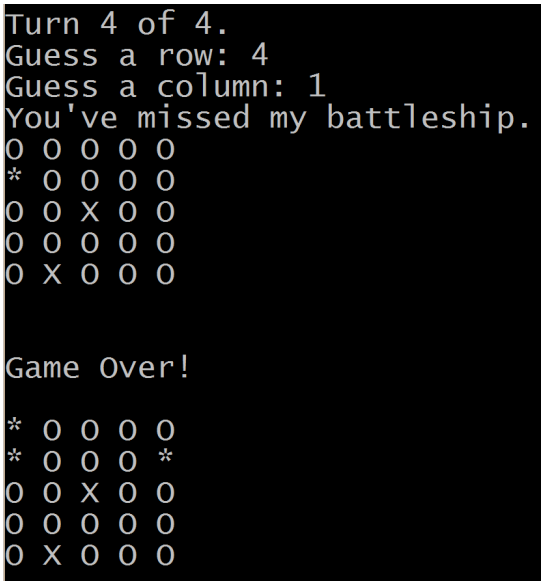

Figure 4: End of game

Deliverable

Put your:

- Java source file(s)
- Screenshot(s) of your successful test run

in a zip file. Submit your zipped file to the appropriate dropbox.