CS 152 Computer Programming Fundamentals
Project 6: Lights Out

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This project is designed to let you practice manipulated 2D arrays in the context of an old electronic puzzle game.

The game of Lights Out[1] consists of a grid of lights. Initially, some of these lights are switched on. Pressing one of the lights will toggle it and the four adjacent lights[2]. The goal is to turn off all the lights, preferably with as few button presses as possible.[3]

1 Program Description

I'm providing you with three files of code for this assignment

- `LightsOut.java` contains the methods to manage the Lights Out game. There are nine methods you must complete to be able to play the game. The `main` method in this class will set up the game board and start the GUI.

- `LightsOutGUI.java` manages the GUI (Graphical User Interface) for the game. It will use the methods in `LightsOut.java` to set up a game and determine the results of pressing a light. You don't need to understand the code in this class, but feel free to take a look. The only method you need to use is `showGUI`, which is already being called in `LightsOut`'s `main` method in the code I gave you.

- `LightsOutTester.java` contains code to test the `LightsOut.java` methods. If you run this class, it will report how many tests you passed. You may find this especially useful when you have yet to complete enough methods to be able to play the game.

1.1 Board Representation

The board is represented as a two-dimensional array of `boolean`s, which each entry indicating the state of the light at that position (true for on, false for off). The GUI and testing code

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[1] https://en.wikipedia.org/wiki/Lights_Out_(game)

[2] or fewer neighbors if the selected light is at the edge of the board, obviously

[3] Determining if an arbitrary pattern of lights is solvable (not all have a solution!) and finding a minimal solution is beyond the scope of this project.

assume that the first row is at the top and the first column is on the left.[4]

2 Turning in your assignment

Submit your **LightsOut.java** file to the assignment in Canvas. Do not attach `.class` files or any other files.

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[4]This is what we usually do with 2D arrays anyway, but it's good to make sure we're all on the same page.