The game of Minesweeper

In this game of Minesweeper, a player searches for hidden bombs on a rectangular grid. The game board is represented by a grid of booleans marking bomb locations. A grid value is true if there is a bomb at that location, false otherwise. A user can click on any cell they choose. The game is lost when the user clicks on a cell containing a bomb. The game is won when all cells not containing bombs have been opened and the only remaining cells are those containing bombs.

Given such a grid of bomb locations, the method createCountGrid() constructs a new grid of integers storing the count of bombs in each neighborhood. The neighborhood for a location includes the location itself and its eight adjacent locations. In the returned grid, each value will be a number from 0 to 9.

If passed the boolean grid on the left, createCountGrid() returns the grid of int values on the right:

Here are the example grids:

(0,0)

F	F	T	F	F	T	F	F	T	F
F	F	T	T	F	F	F	F	F	T
F	F	T	F	T	F	F	T	F	F
T	F	F	F	F	F	F	T	F	F
F	F	F	F	T	F	F	T	F	F
F	F	T	F	F	T	F	T	F	F
F	F	F	F	F	F	F	F	F	F
F	F	F	F	T	F	T	F	T	T
F	T	T	F	F	F	F	F	F	F
T	F	F	F	F	F	T	T	F	F

(0,0)

0	2	3	3	2	1	1	1	2	2
0	3	4	5	3	2	2	2	3	2
1	3	3	4	2	1	2	2	3	1
1	2	1	3	2	2	3	3	3	0
1	2	1	2	2	2	4	3	3	0
0	1	1	2	2	2	3	2	2	0
0	1	1	2	2	3	3	3	3	2
1	2	2	2	1	2	1	2	2	2
2	3	2	2	1	3	3	4	3	2
2	3	2	1	0	1	2	2	1	0

The examples below demonstrate how to compute the countGrid from the bombGrid.

A. In “Example A” one can see the cell [0][0] has a count of 1 because the only adjacent cell containing a bomb is [1][1].

B. In “Example B” one can see the cell [1][2] has a count of 0 because there are no adjacent cells containing a bomb.

C. In “Example C” one can see the cell [1][1] has a count of 4 because there are 4 adjacent cells containing a bomb. [0][0] , [0][2], [2][0], [2][1]

D. In “Example D” one can see the cell [1][1] has a count of 3 because there are 3

adjacent cells containing a bomb (including the cell itself). [1][1] , [2][0], [2][2]

Example A

F	F	F
F	T	T
T	F	F

1	2	2
2	3	2
2	3	2

Example B

T	F	F
T	F	F
T	F	F

2	2	0
3	3	0
2	2	0

Example C

T	F	T
F	F	F
T	T	F

1	2	1
2	4	2
2	2	1

Example D

F	F	F
F	T	F
T	F	T

1	1	1
2	3	2
2	3	2