Cavity Map

HackerRank

You are given a square map as a matrix of integer strings. Each cell of the map has a value denoting its depth. We will call a cell of the map a *cavity* if and only if this cell is not on the border of the map and each cell adjacent to it has *strictly smaller depth*. Two cells are adjacent if they have a common side, or *edge*.

Find all the cavities on the map and replace their depths with the uppercase character **X**.

Example

$grid = ['989', '191', '111']$

The grid is rearranged for clarity:

```
989
191
111
```

Return:

```
989
1X1
111
```

The center cell was deeper than those on its edges: *[8,1,1,1]*. The deep cells in the top two corners do not share an edge with the center cell, and none of the border cells is eligible.

Function Description

Complete the *cavityMap* function in the editor below.

cavityMap has the following parameter(s):

- *string grid[n]:* each string represents a row of the grid

Returns

- *string{n}:* the modified grid

Input Format

The first line contains an integer n, the number of rows and columns in the grid.

Each of the following n lines (*rows*) contains n positive digits without spaces (*columns*) that represent the depth at $grid[row, column]$.

Constraints

$1 \leq n \leq 100$

Sample Input

```
STDIN   Function
-----   --------
4       grid[] size n = 4
1112    grid = ['1112', '1912', '1892', '1234']
1912
1892
1234
```

Sample Output

```
1112
1X12
18X2
1234
```

Explanation

The two cells with the depth of 9 are not on the border and are surrounded on all sides by shallower cells. Their values are replaced by X.