

# 1001. Grid Illumination

## Description

There is a 2D `grid` of size `n x n` where each cell of this grid has a lamp that is initially **turned off**.

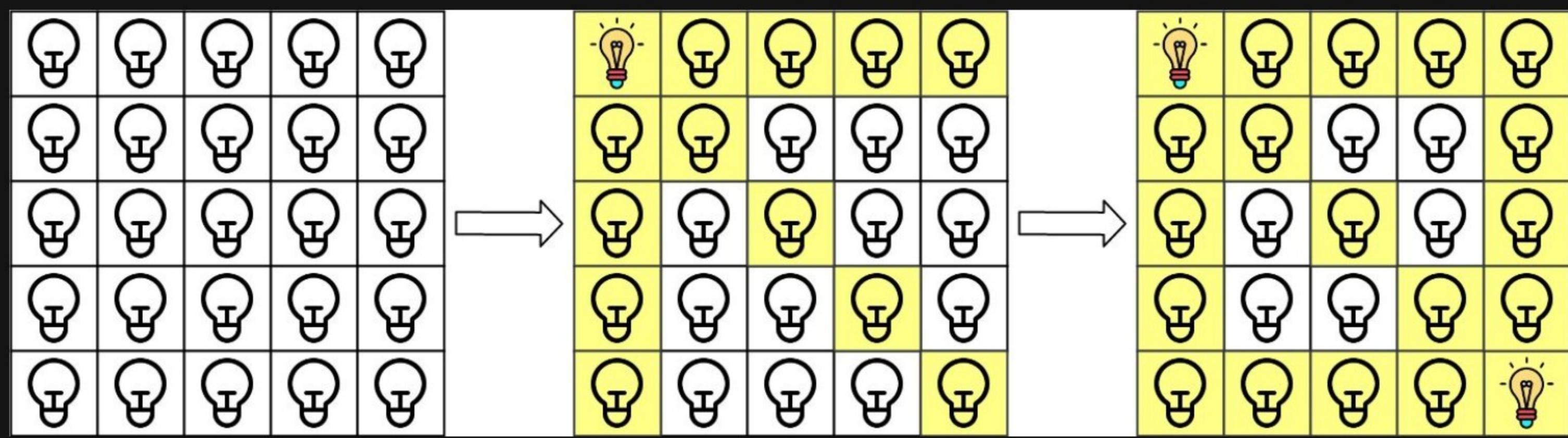
You are given a 2D array of lamp positions `lamps`, where `lamps[i] = [rowi, coli]` indicates that the lamp at `grid[rowi][coli]` is **turned on**. Even if the same lamp is listed more than once, it is turned on.

When a lamp is turned on, it **illuminates its cell** and **all other cells** in the same **row, column, or diagonal**.

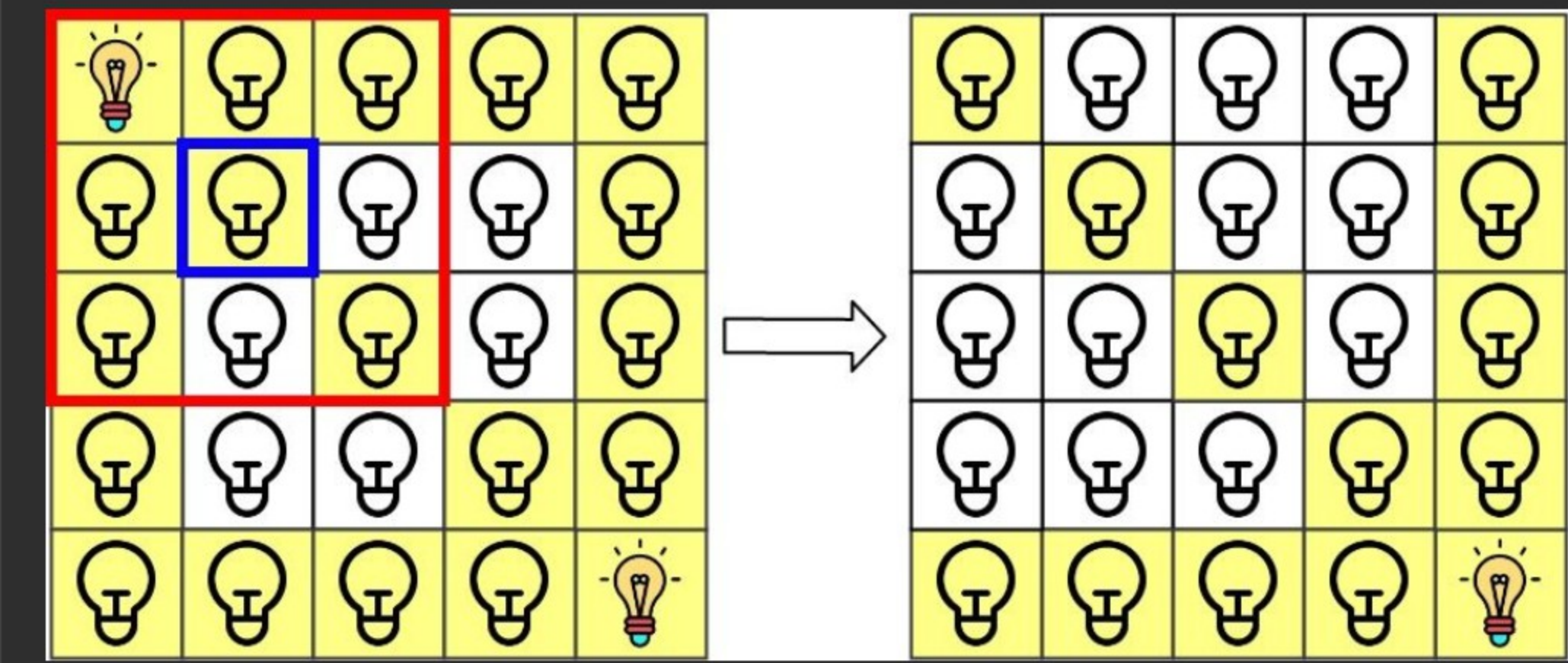
You are also given another 2D array `queries`, where `queries[j] = [rowj, colj]`. For the `jth` query, determine whether `grid[rowj][colj]` is illuminated or not. After answering the `jth` query, **turn off** the lamp at `grid[rowj][colj]` and its **8 adjacent lamps** if they exist. A lamp is adjacent if its cell shares either a side or corner with `grid[rowj][colj]`.

Return *an array of integers* `ans`, where `ans[j]` *should be* `1` *if the cell in the* `jth` *query was illuminated, or* `0` *if the lamp was not.*

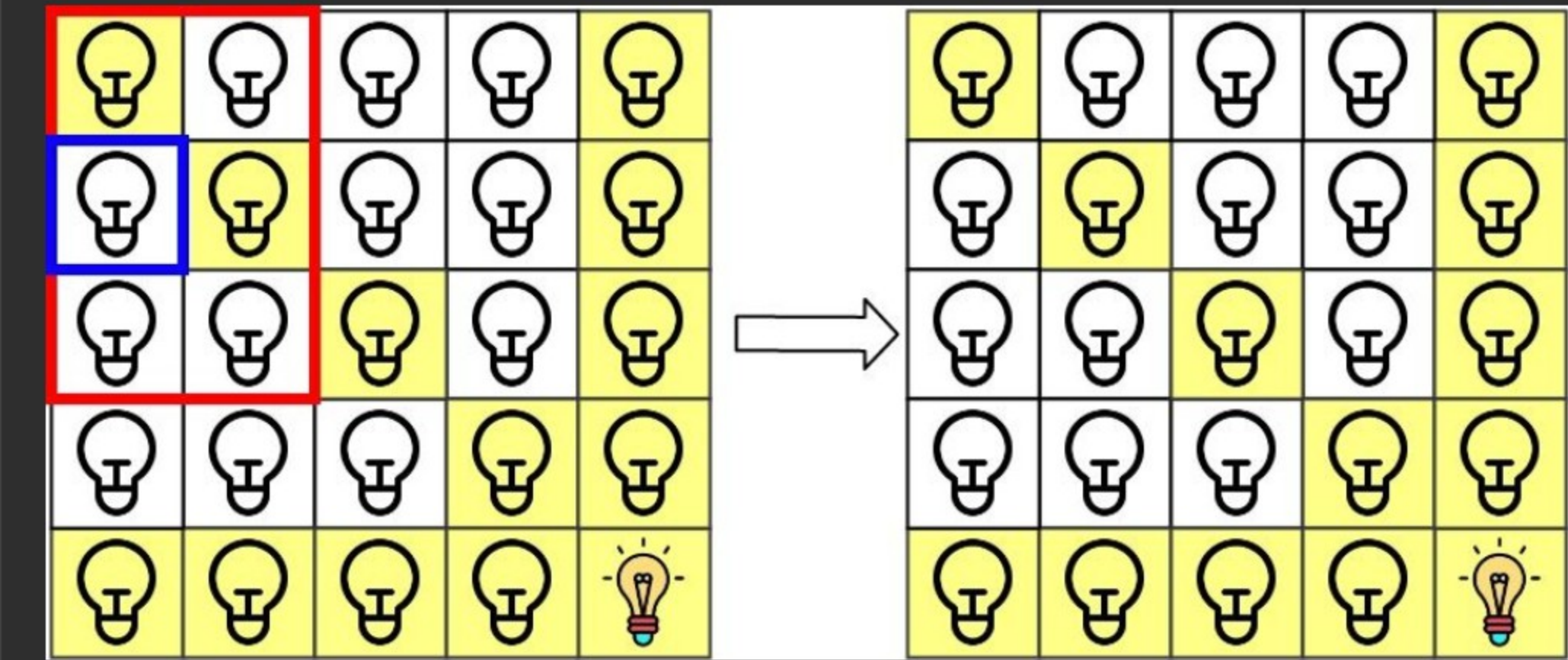
### Example 1:



**Input:** `n = 5, lamps = [[0,0],[4,4]], queries = [[1,1],[1,0]]`  
**Output:** `[1,0]`  
**Explanation:** We have the initial grid with all lamps turned off. In the above picture we see the grid after turning on the lamp at `grid[0][0]` then turning on the lamp at `grid[4][4]`. The 0<sup>th</sup> query asks if the lamp at `grid[1][1]` is illuminated or not (the blue square). It is illuminated, so set `ans[0] = 1`. Then, we turn off all lamps in the red square.



The 1<sup>st</sup> query asks if the lamp at `grid[1][0]` is illuminated or not (the blue square). It is not illuminated, so set `ans[1] = 0`. Then, we turn off all lamps in the red rectangle.



### Example 2:

**Input:** `n = 5, lamps = [[0,0],[4,4]], queries = [[1,1],[1,1]]`  
**Output:** `[1,1]`

### Example 3:

**Input:** `n = 5, lamps = [[0,0],[0,4]], queries = [[0,4],[0,1],[1,4]]`  
**Output:** `[1,1,0]`

### Constraints:

- `1 <= n <= 109`
- `0 <= lamps.length <= 20000`
- `0 <= queries.length <= 20000`
- `lamps[i].length == 2`
- `0 <= rowi, coli < n`
- `queries[j].length == 2`
- `0 <= rowj, colj < n`

