

Problem 3311: Construct 2D Grid Matching Graph Layout

Problem Information

Difficulty: Hard

Acceptance Rate: 28.96%

Paid Only: No

Tags: Array, Hash Table, Graph, Matrix

Problem Description

You are given a 2D integer array `edges` representing an **undirected** graph having `n` nodes, where `edges[i] = [ui, vi]` denotes an edge between nodes `ui` and `vi`.

Construct a 2D grid that satisfies these conditions:

- * The grid contains **all nodes** from `0` to `n - 1` in its cells, with each node appearing exactly **once**.
- * Two nodes should be in adjacent grid cells (**horizontally** or **vertically**) **if and only if** there is an edge between them in `edges`.

It is guaranteed that `edges` can form a 2D grid that satisfies the conditions.

Return a 2D integer array satisfying the conditions above. If there are multiple solutions, return `_any_` of them.

Example 1:

Input: `n = 4, edges = [[0,1],[0,2],[1,3],[2,3]]`

Output: `[[3,1],[2,0]]`

Explanation:

****Example 2:****

****Input:**** n = 5, edges = [[0,1],[1,3],[2,3],[2,4]]

****Output:**** [[4,2,3,1,0]]

****Explanation:****

****Example 3:****

****Input:**** n = 9, edges = [[0,1],[0,4],[0,5],[1,7],[2,3],[2,4],[2,5],[3,6],[4,6],[4,7],[6,8],[7,8]]

****Output:**** [[8,6,3],[7,4,2],[1,0,5]]

****Explanation:****

****Constraints:****

* $2 \leq n \leq 5 \cdot 10^4$ * $1 \leq \text{edges.length} \leq 105$ * $\text{edges}[i] = [u_i, v_i]$ * $0 \leq u_i < v_i < n$ * All the edges are distinct. * The input is generated such that `edges` can form a 2D grid that satisfies the conditions.

Code Snippets

C++:

```
class Solution {
public:
    vector<vector<int>> constructGridLayout(int n, vector<vector<int>>& edges) {

    }

};
```

Java:

```
class Solution {  
    public int[][] constructGridLayout(int n, int[][] edges) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def constructGridLayout(self, n: int, edges: List[List[int]]) ->  
        List[List[int]]:
```