Graph Concepts & Qns

video - 48

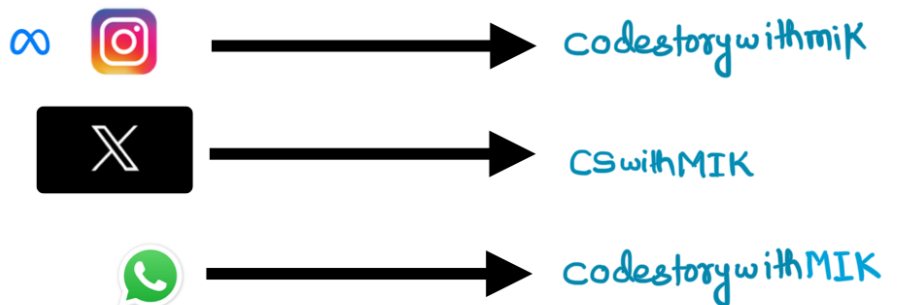codestorywithMIK

∞ ⟶ codestorywithmiK

X ⟶ CSwithMIK

 ⟶ codestorywithMIK

Motivation :-

A stone is broken by the last stroke of hammer. That doesn't mean that first stroke is

MIK...

useless.

Success is the result of continuous effort.

Multi-Source.
Rotting Oranges.

1765. Map of Highest Peak

Medium | 🏷 Topics | 🔒 Companies | 💡 Hint

You are given an integer matrix `isWater` of size `m x n` that represents a map of **land** and **water** cells.

- If `isWater[i][j] == 0`, cell `(i, j)` is a **land** cell.
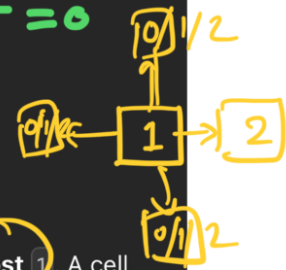- If `isWater[i][j] == 1`, cell `(i, j)` is a **water** cell. → Height = 0

You must assign each cell a height in a way that follows these rules:

- The height of each cell must be non-negative.
- If the cell is a **water** cell, its height must be `0`
- Any two adjacent cells must have an absolute height difference of **at most** 1. A cell is adjacent to another cell if the former is directly north, east, south, or west of the latter (i.e., their sides are touching).

Find an assignment of heights such that the maximum height in the matrix is **maximized**.

Return *an integer matrix* `height` *of size* `m x n` *where* `height[i][j]` *is cell* `(i, j)`'s *height. If there are multiple solutions, return* **any** *of them.*

Example:—

isWater =

0	1
0	0

Output =

1	0
2	1

maxHei = 2

| 0 | 0 | 1 |

isWater =

1 ᵂ	0	0
0	0	0

Output:

1	1	0
0	1	1
1	2	2

max4 = 2

Thought Process

isWater

0	0	1
1	0	0
0	0	0

height

1	1	0
0	1	1
1	2	2

→ Always start from water cells = 0

⇒ DFS ✗

⇒ BFS ? ✗

Multi-Sorce BFS. → BFS from all 0 cells simulta.

0   1   2

iswater

		3
0	0	1
1	0	0
1	0	0

0	1	1	0
1	0	1	1
2	0	1	2

MaxHt = 2

(2,2)

Key points to notice in the Qn :-

① Multiple starting points → water cells with height 0.

② Assignment needs to be done simultaneously from all sources.

Ask yourself :-

① Are there multiple starting points?

② Does the problem involve propagting information (height, distance et) to all other nodes?

जय हो (M)ulti-Source BFS की

isWater =

0	0	1
0	0	0
1	0	0