Let's begin at 9:05 PM

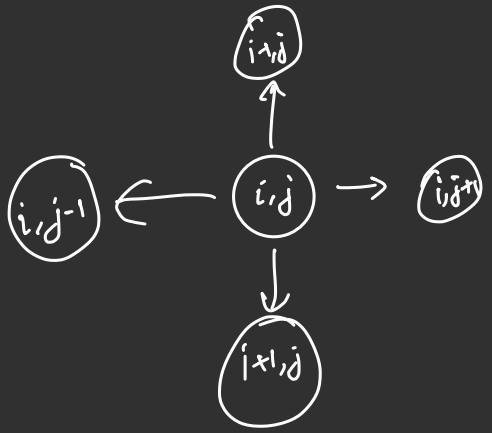
L95
Graphs Problem Solving 4

Join Discord - https://bit.ly/ly-discord

RECAP

1. Longest Increasing Path

Intuition / Solution

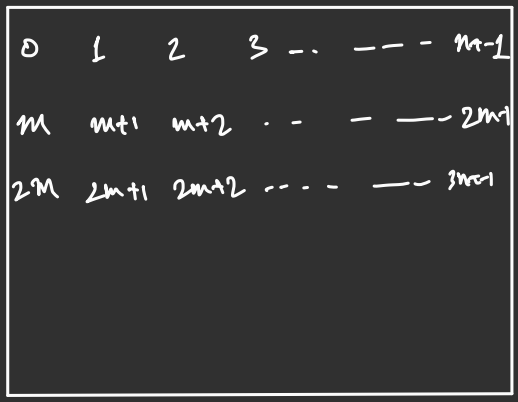


(i, j) for ni
calls if n
cell value >
a[i][j]

No cycle ⟹ DAG

dp[i] ⇒ longest path starting at node i.

```
dp[i] = 1;
for (int nb : adj[i])
    dp[i] = max(dp[i], 1 + dp[nb]);
```



(i, j)

$\Downarrow$

$i * m + j$

Vi adj[N];

Vi adj[n][m] $\Rightarrow$ adj[i][j]

$\Downarrow$

neighbours of (i,j)

Let’s Implement

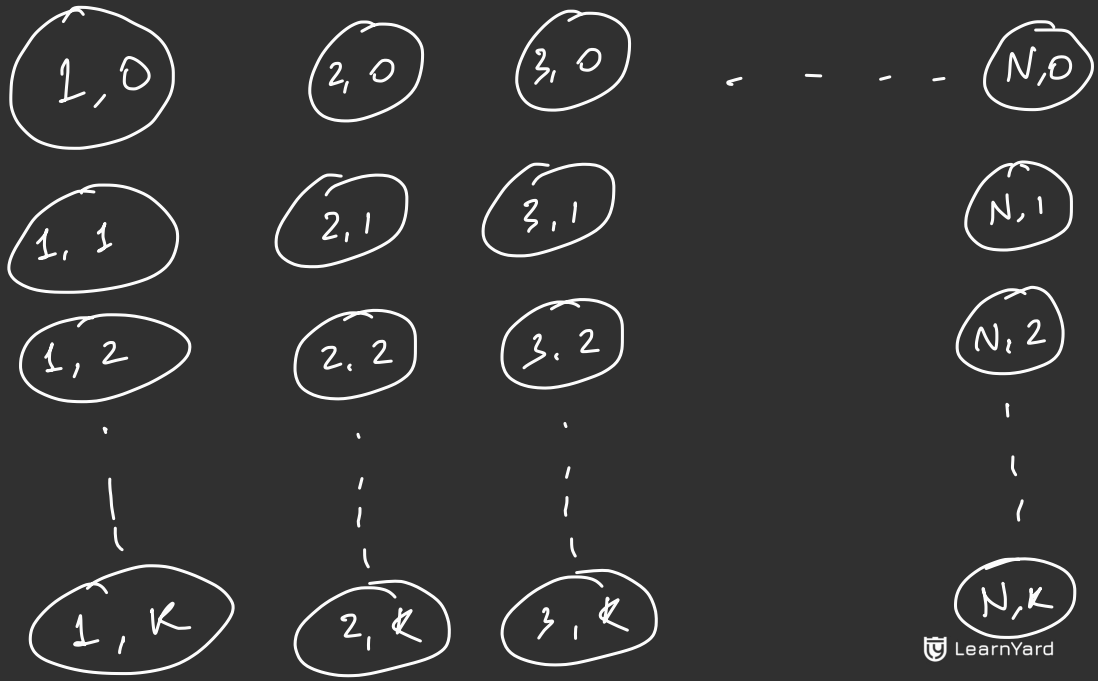
2. Shortest Path with Obstacles

Intuition / Solution

N nodes in graph

Some nodes are obstacles

We can eliminate maximum K obstacles.



(i, j)

Node i

Eliminated j obstacles so far

Consider all neighbours of node i:

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if nb is a free node:

$(i, j) \longrightarrow (nb, j)$

---

if obstacle:

if $j < x$:

$(i, j) \longrightarrow (nb, j+1)$

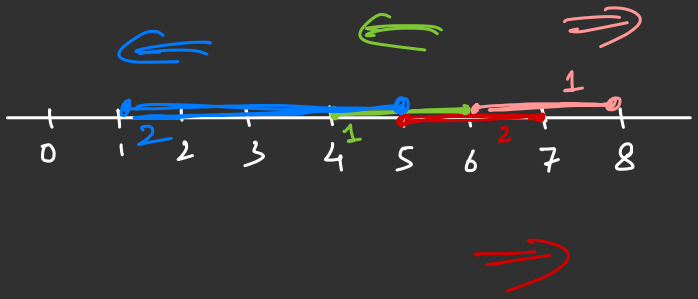
else:

no edge

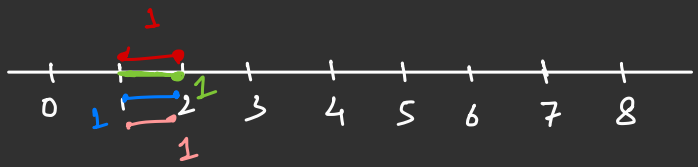
Let’s Implement

3. Moving Segments

```
4
5 7 2
4 6 1
1 5 2
6 8 1
```



```
4
1 2 1
1 2 1
1 2 1
1 2 1
```



NO

Intuition / Solution

A pair of segments has to sent in diff. directions if :

1.) They overlap or touch at $t = 0$

2.) and their V_i values are same.

Let's Implement

(Decided to
just discuss
logic in the class)

Thank You!

Reminder: Going to the gym & observing the trainer work out can help you know the right technique, but you'll muscle up only if you lift some weights yourself.

So, PRACTICE, PRACTICE, PRACTICE!