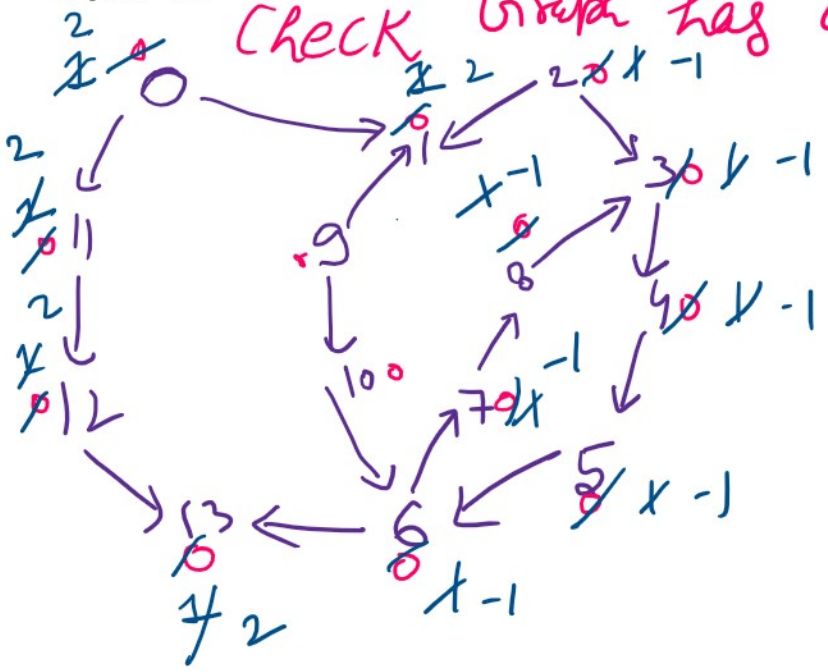
Lecture5

06 August 2022 11:24

Check Graph has cycle or Not.



-1 → part of cycle.

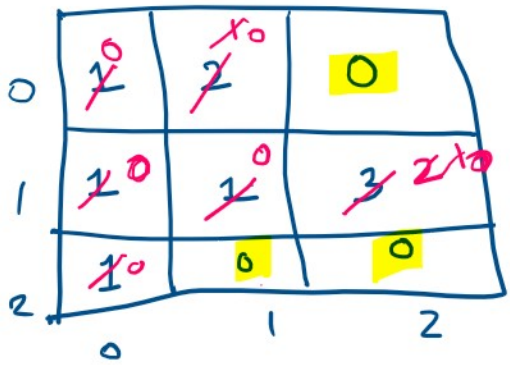
0 → unvisited

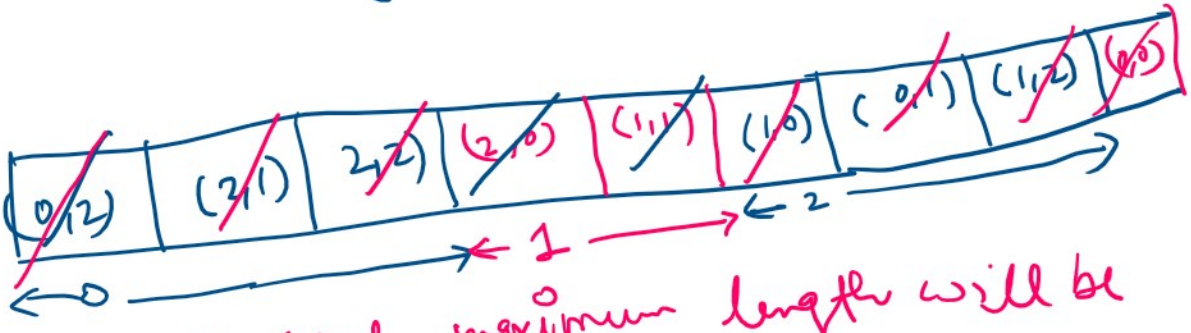
1 → part of the path

2 → visited.

Leetcode 329.

9	9 ← 4	
6	6 → 8	
2 ← 1	1	





So total maximum length will be

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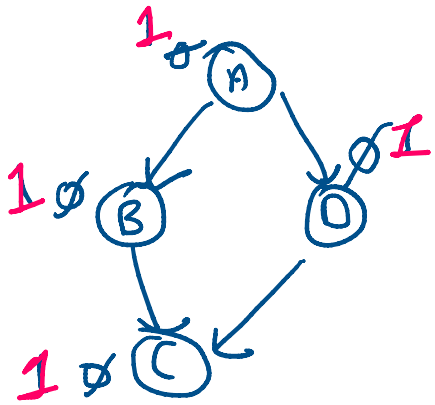
= time + 2 = 2 + 2 = 4.

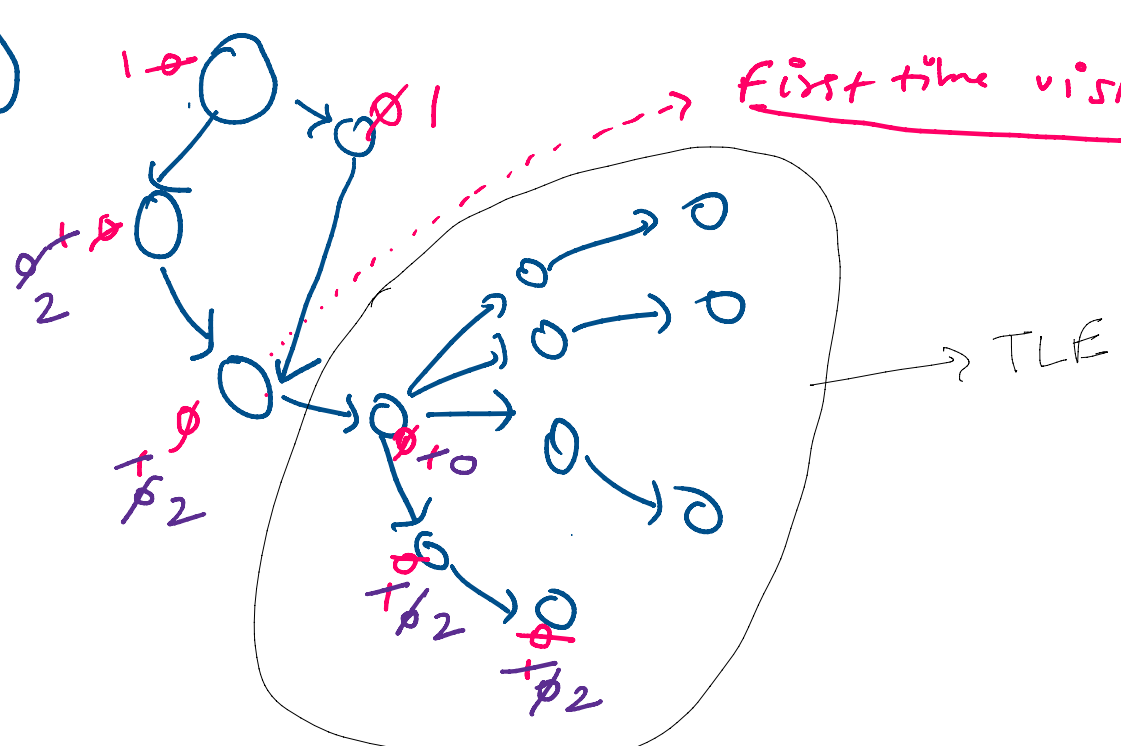
Test cases to check how to detect cycle in Graph

(1)



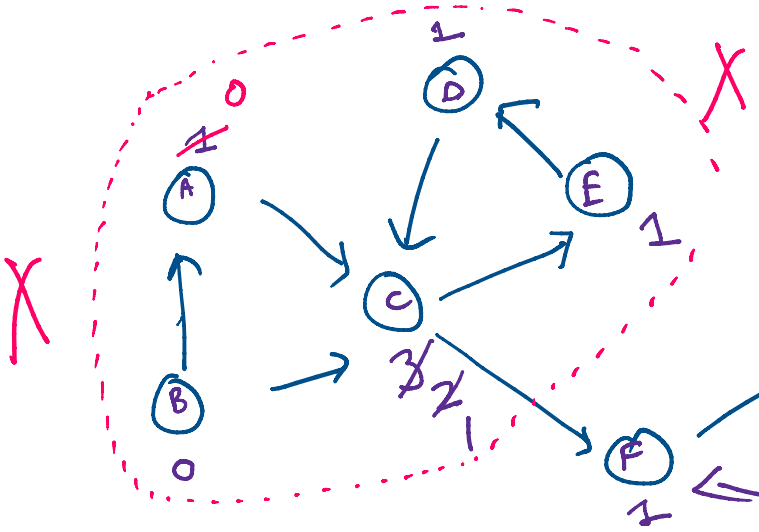
if i did not unmark while backtracking, this will give me wrong ans.

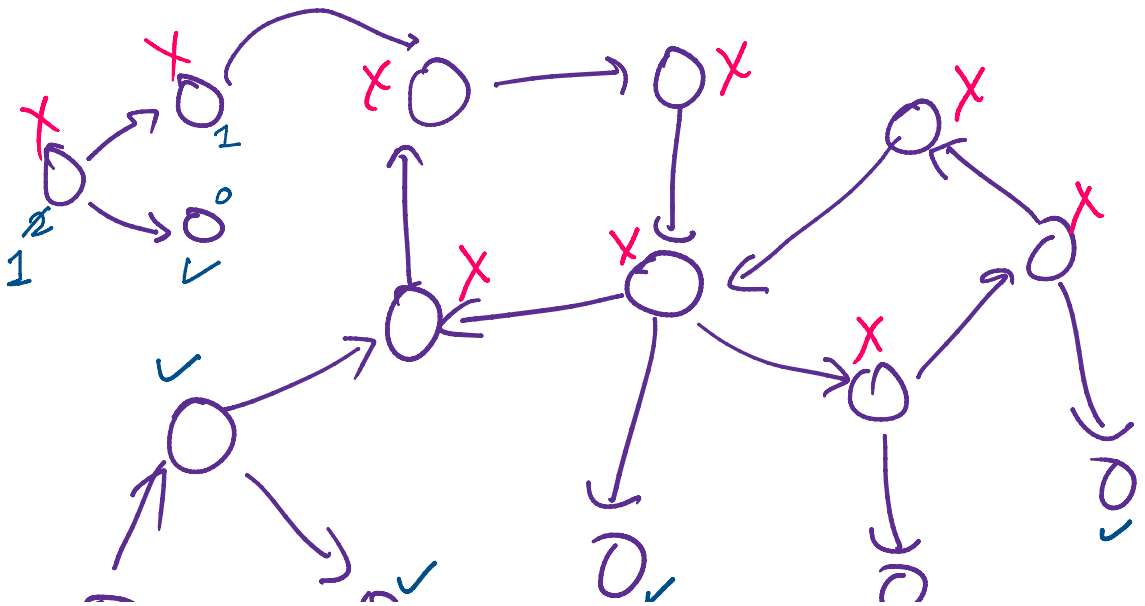
(2)

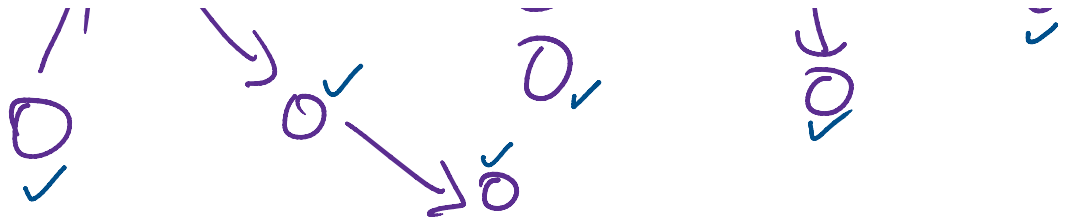


Some Info Points about

Topo sort



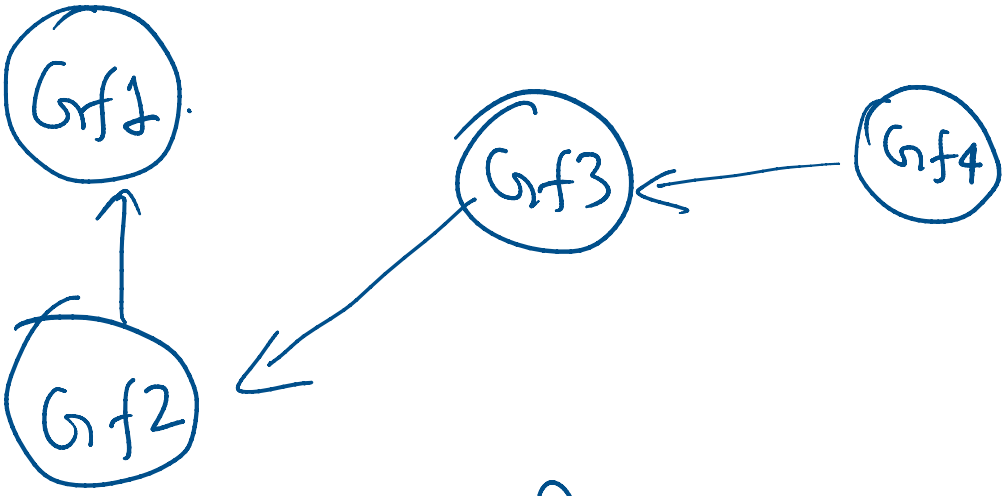




- If we are coming to a Node which is part of cycle, then we can 100% say that all the nodes that can reach that node will also be the part of cycle. So if I want to find nodes that are not contributing to the cycle what I have to do ??.

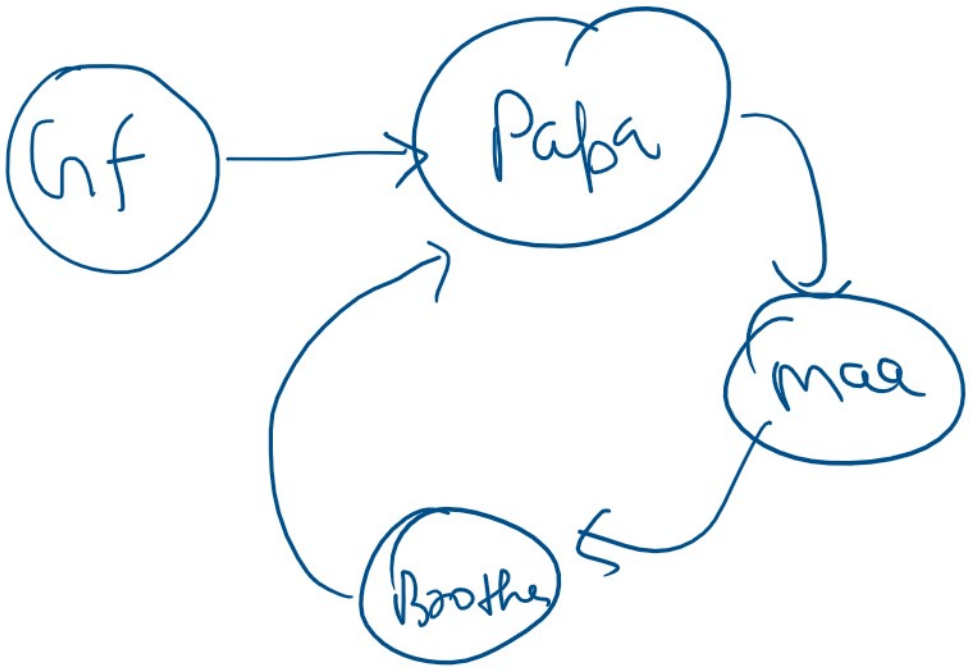
↳ Reverse the Edges of the Graph and apply Kosh's algo and at the end if u find that we

If any of u path then we are going to a node which is part of cycle than we are sure that we will never come in that cycle in the actual graph, as we have Reversed the edges.



So for making Grf4 first Grf3, Grf2, Grf1 required, until or unless there is Grf1, Grf4 can't exist.

So topo sort. ⇒ Gf1. Gf2. Gf3. Gf4.

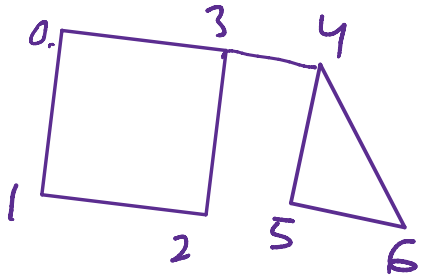


Union Find Algo.

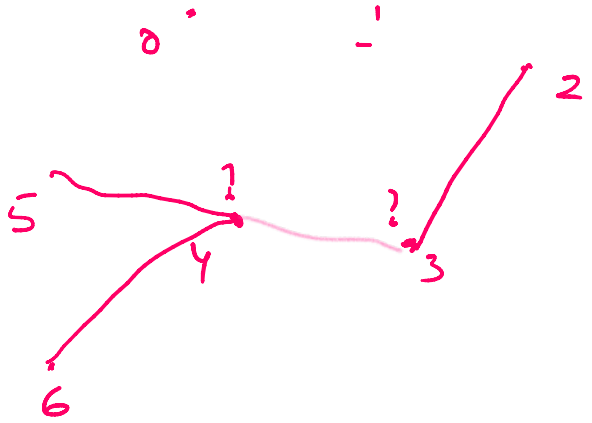
A ∪ B = B ∪ A (In maths)

A → 10^3
B → 10

→ A ∪ B ↘ time taken is less
B ∪ A ↘ more time required.



Leader	0	1	4 ~~2~~	~~2~~ ~~3~~	4	4 ~~5~~	~~4~~
size	1	1	~~2~~ x	1	x ~~x~~	1	1
	0	1	2	3	4 ~~5~~	5	6



If two sets belong to same set and there is an Edge between them, there is a cycle.

Path compression for optimization.

↙

Complexity O(4) → average.

find(x) → average.

Size + path Compression = $\log n$.