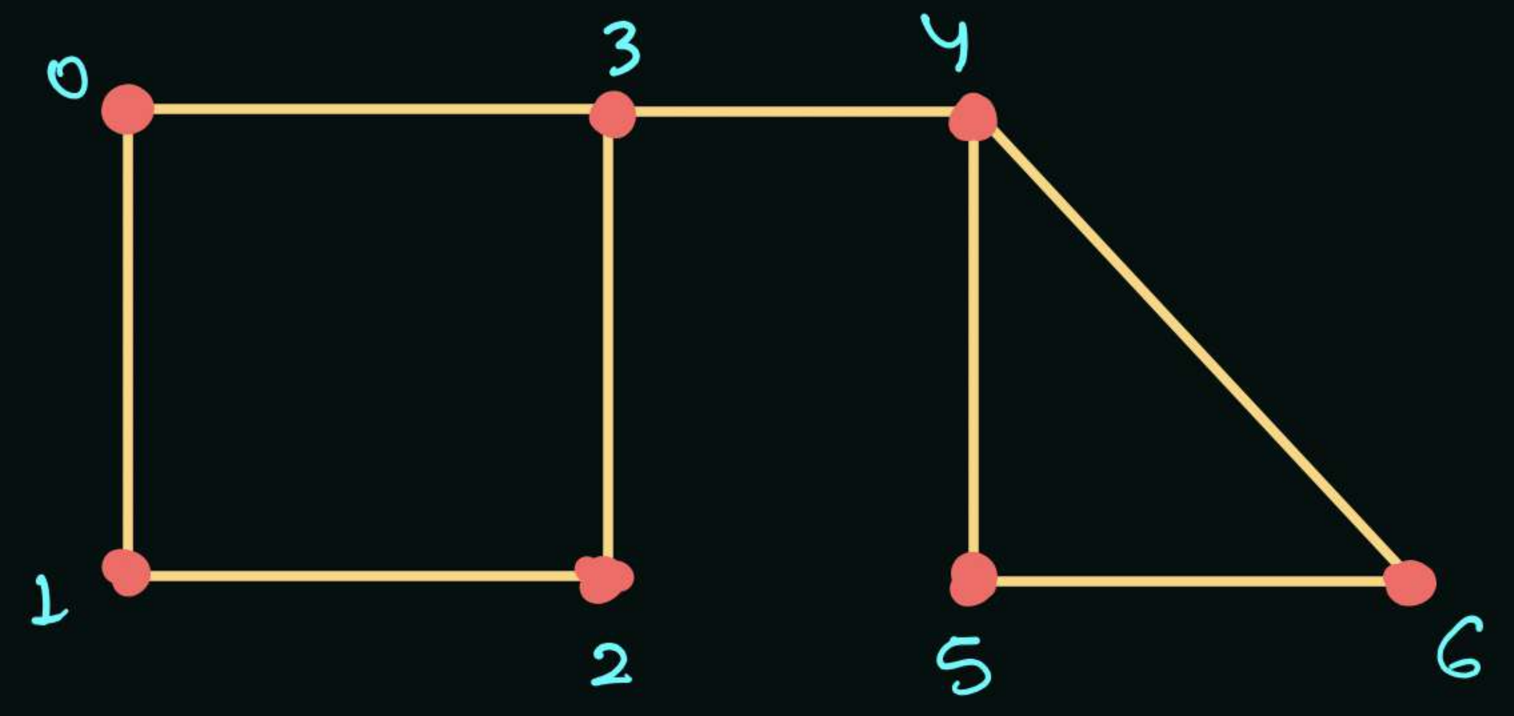
Eulerian Path & Circuit

Sunday, 31 October 2021 9:59 AM



Travel whole graph & every Edge without visit any Edge twice.

↳ path

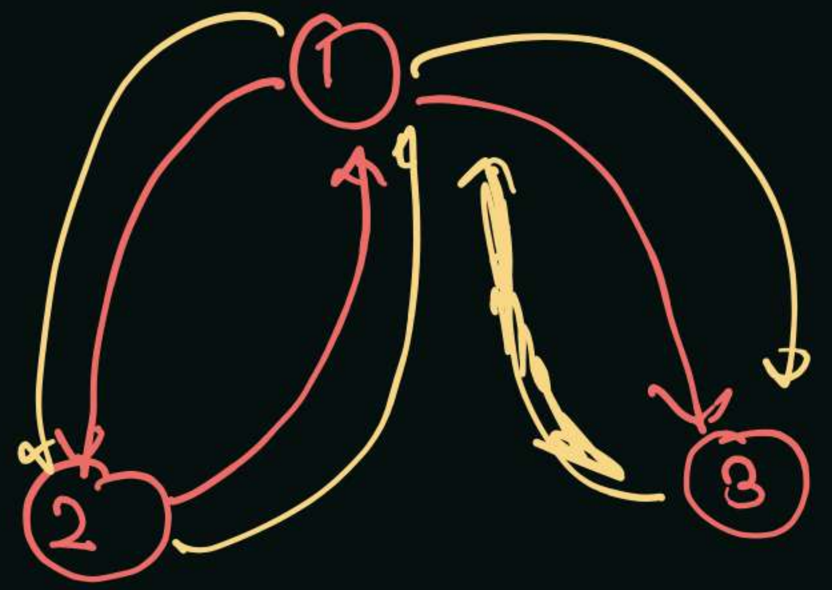
circuit → If starting point is same as ending point then that path is known as circuit.

Eulerian path exist in undirected graph?

Eulerian circuit exist in undirected graph?

Eulerian path exist in directed graph?

Eulerian circuit exist in directed graph?



1 - 2 → 1 → 3 ⟶ Eulerian path.

2 - 1 - 3 ⟶ Eulerian path.

Eulerian path and circuit

graph - connected.

undirected graph

degree

directed graph.

Indegree and outdegree

Undirected graph

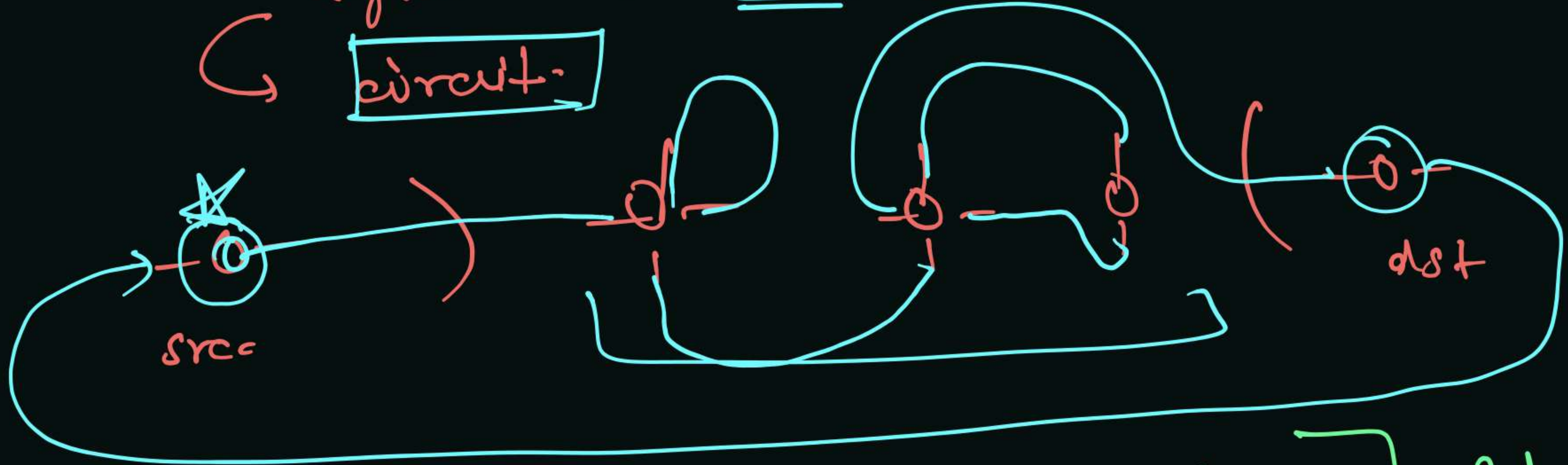
audio??

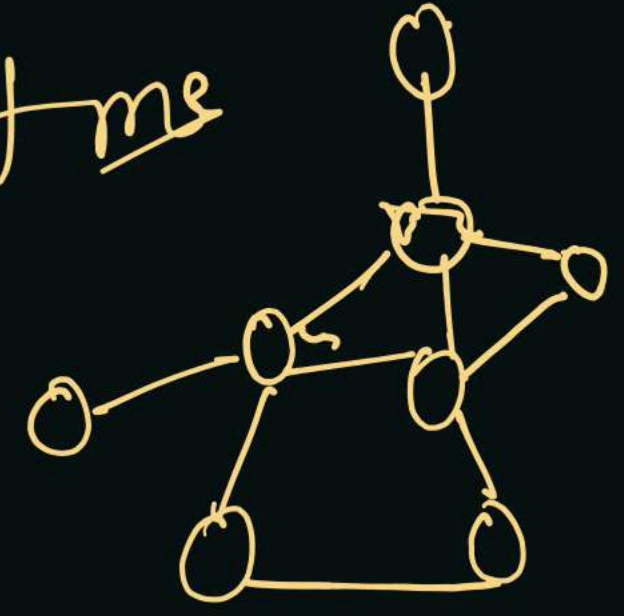
text me

Eulerian circuit.

degree → Even for all vertex

circuit.





(n-2) vertex degree - Even.

Strictly 2 nodes degree - odd

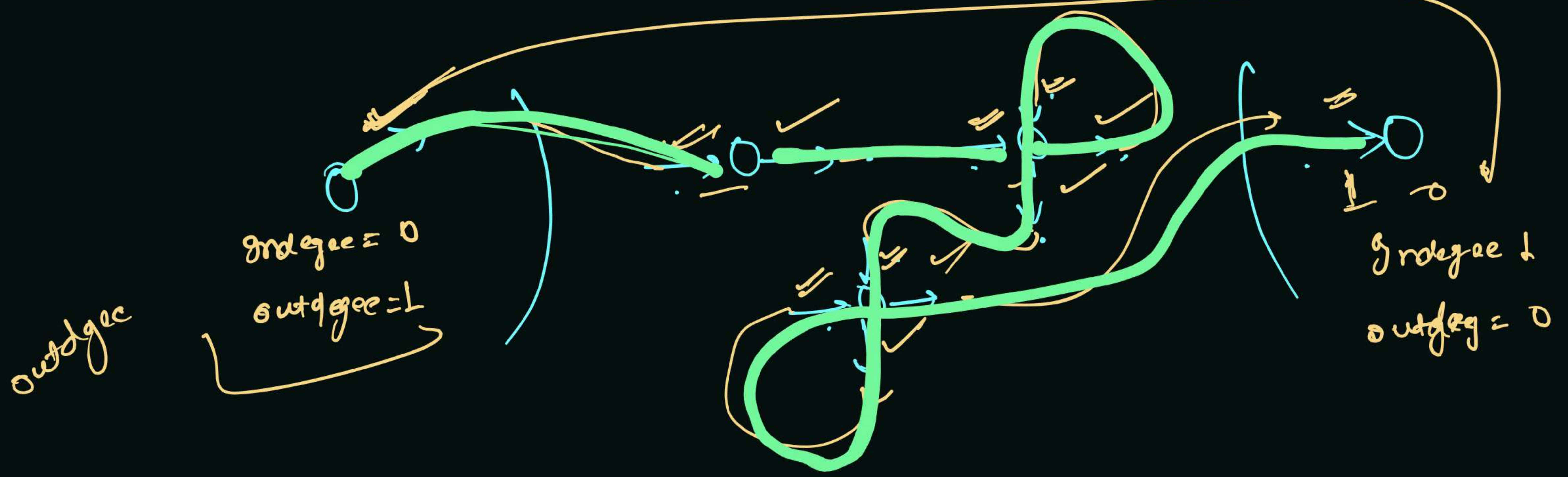
Eulerian path.

directed graph → Indegree and outdegree

Eulerian circuit ⟷ indegree == outdegree] → for Every node.

Eulerian path → ✓ (n-2) nodes have indegree == outdegree for Every nodes

✓ indegree = outdegree ±1 || outdegree == indegree+1



total Indegree = 6

total outdegree = 7

Reconstruct Itinerary

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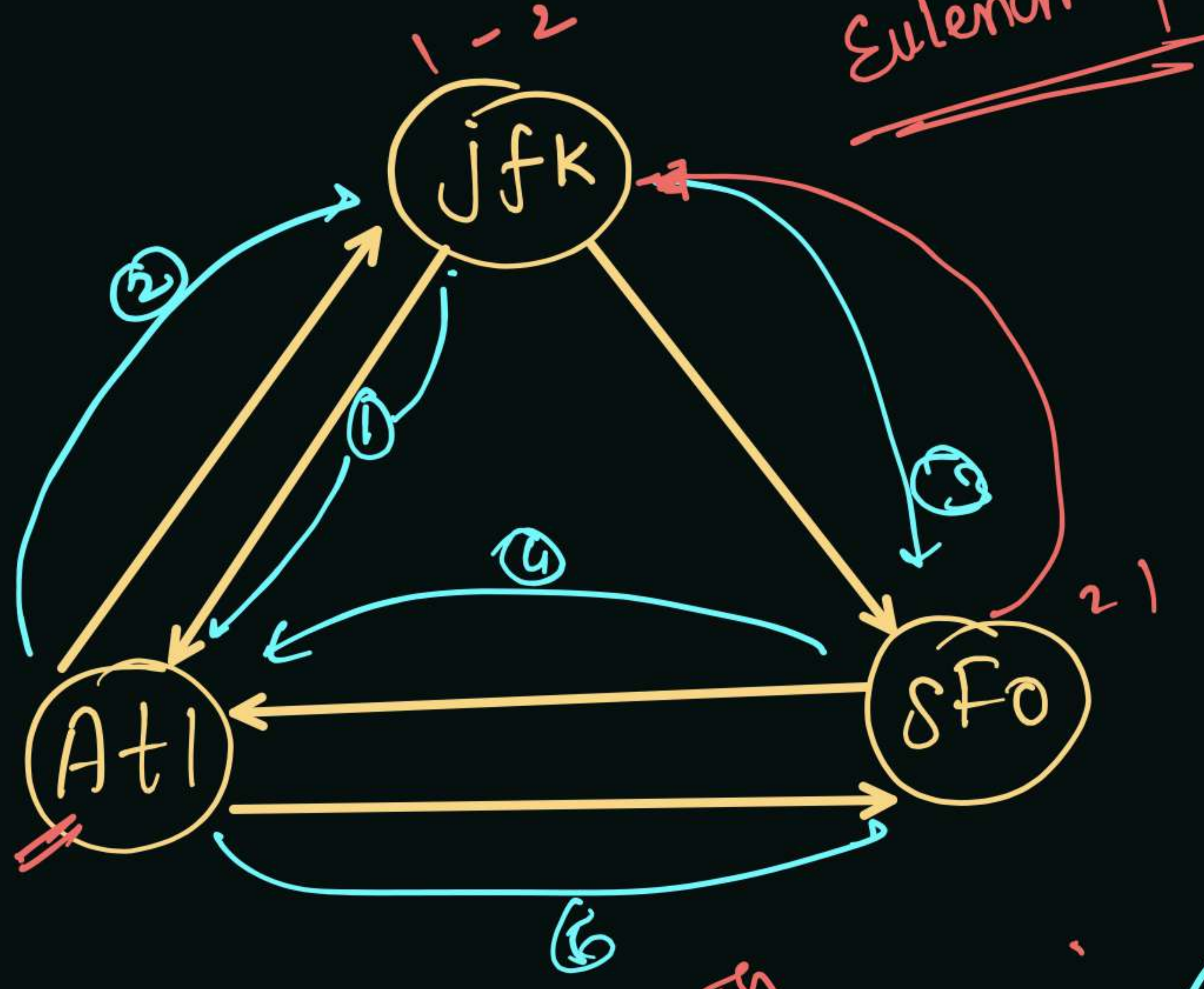
Eulerian path.



3 vertex

path

2 → i'nt

2 —

Indeg = outdeg + 1

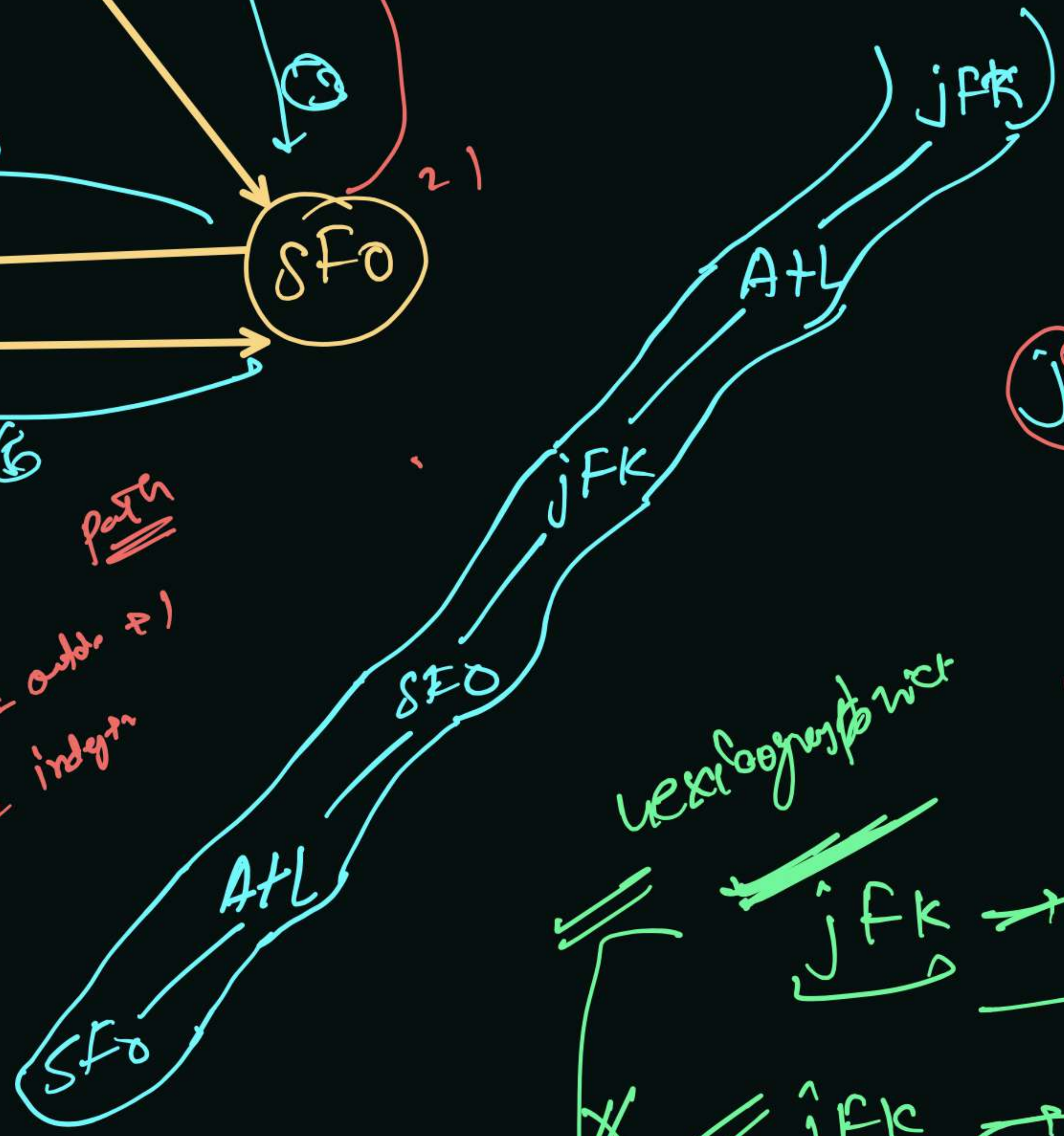
out = indegree

jfk	→	~~Atl~~	~~SFO~~
Atl	→	~~jfk~~	~~SFO~~
SFO	→	~~Atl~~	

source → (jfk)

→ "a" a' g b d e

→ a b h c d e



Post order

LinkedList

jfk - ATL - jfk - SFO - ATL - SFO → jfk

add first

↳ O(1)

graph.

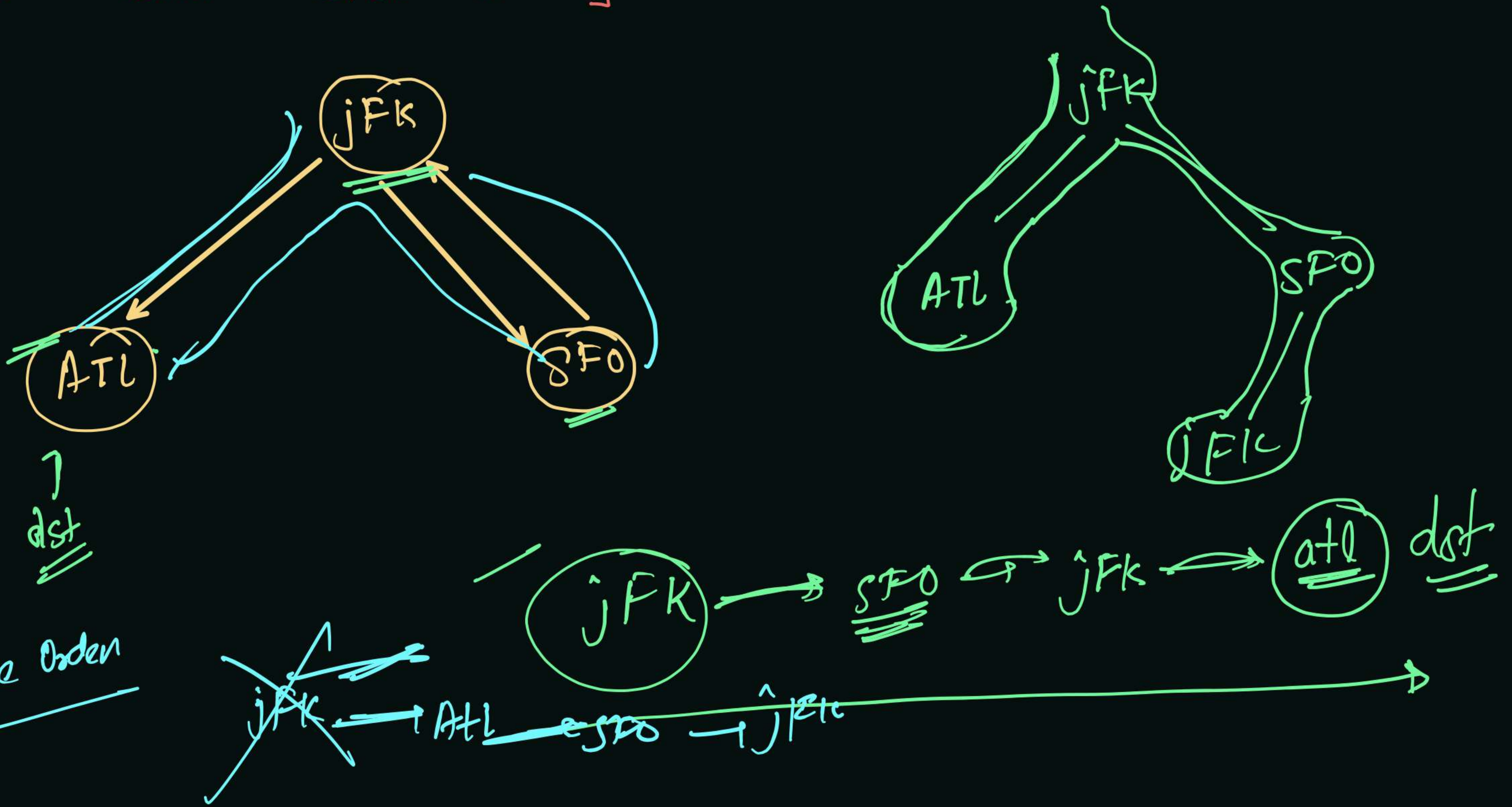
HashMap < String , priorityQue < String > > graph

Lexicographical

jfk → ATL → jfk → SFO → ATL → SFO

~~jfk → SFO → ATL → jfk → ATL → SFO~~

Problem with construction of answer in Pre Order ?



Pepcoder and Reversing

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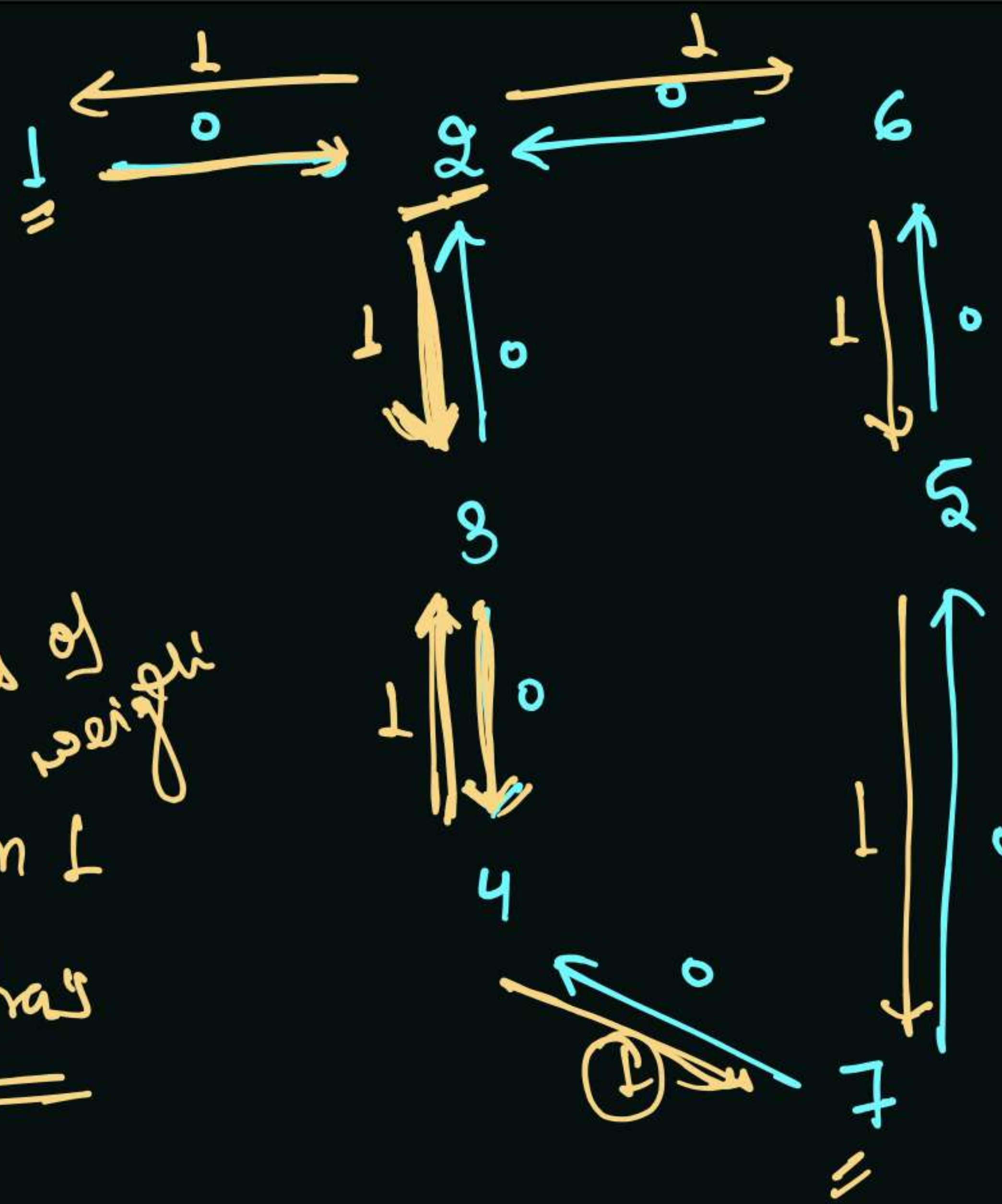


Min Number of Edge required to reverse, such that we can visit from 1 to N, i-e

1 to 7.

Hint

① add Reverse Edge with cost 1

② find shortest path → interms of weight from 1 to N using Djikstras

Algo

cost == Result

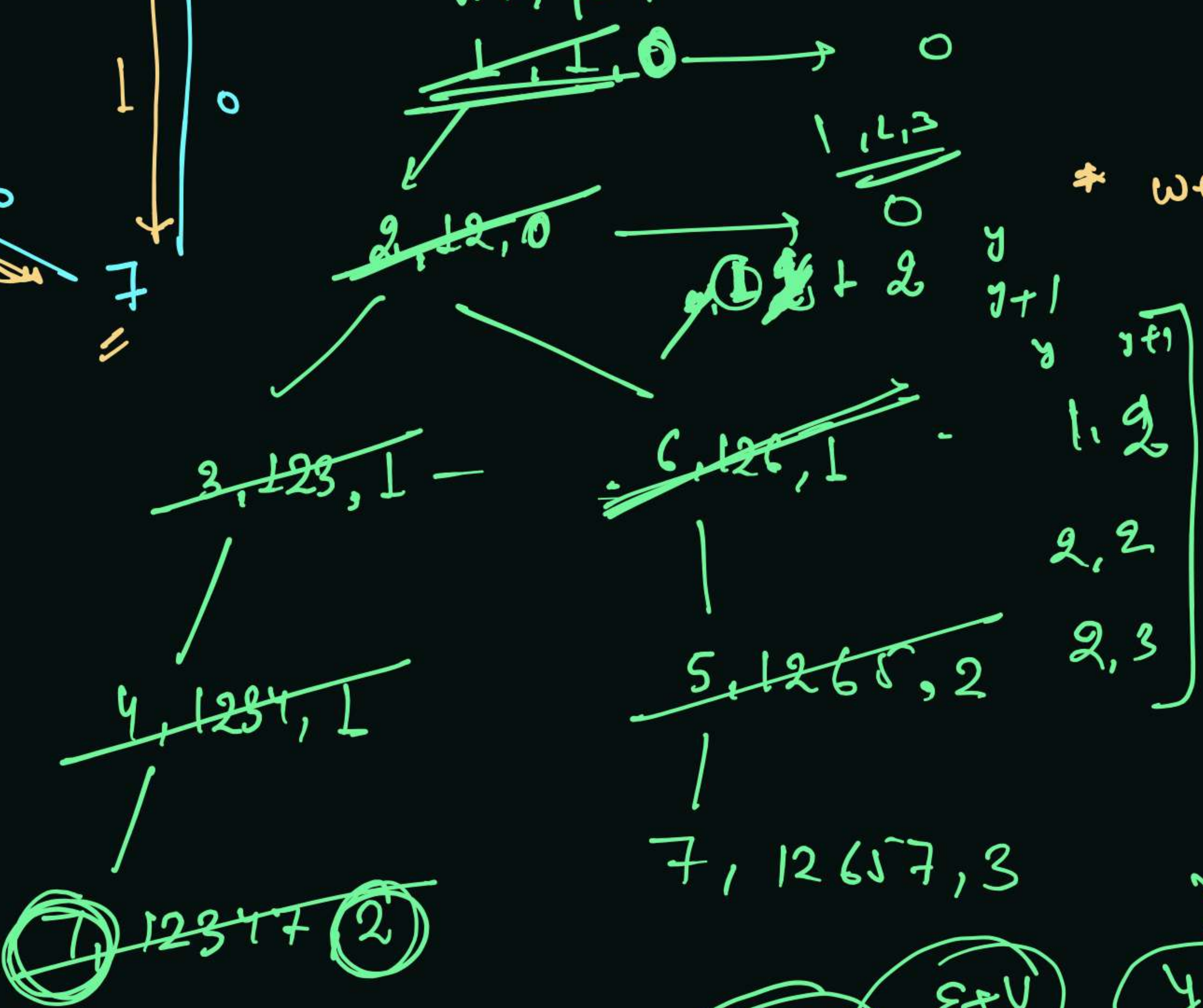
1 to N

(E log V)

$\boxed{\text{Result} = 2}$

2 = Return

vtx, psf, csf



* BFS ≡ Djikstra

queue ⇒ priority Queue

* weight → 0, 1

priority Queue

wt

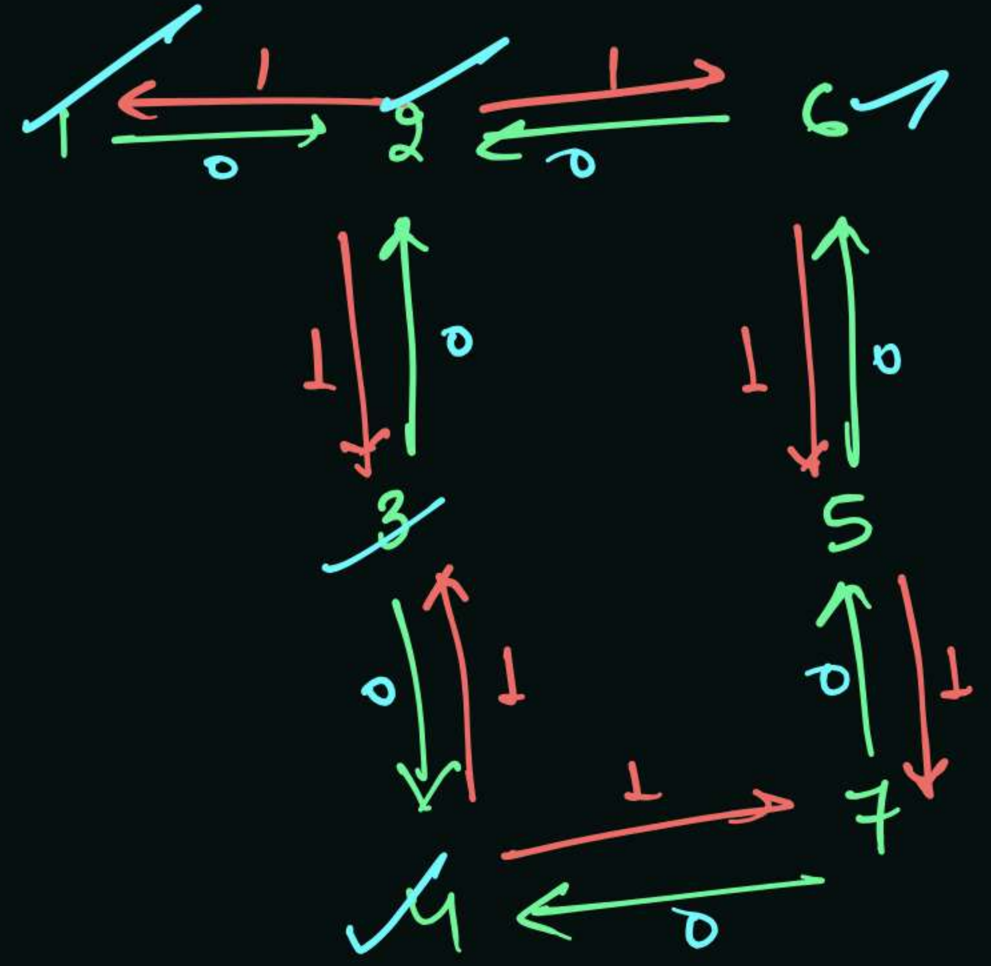
y

y+1

BFS E+V

y+n

y+2

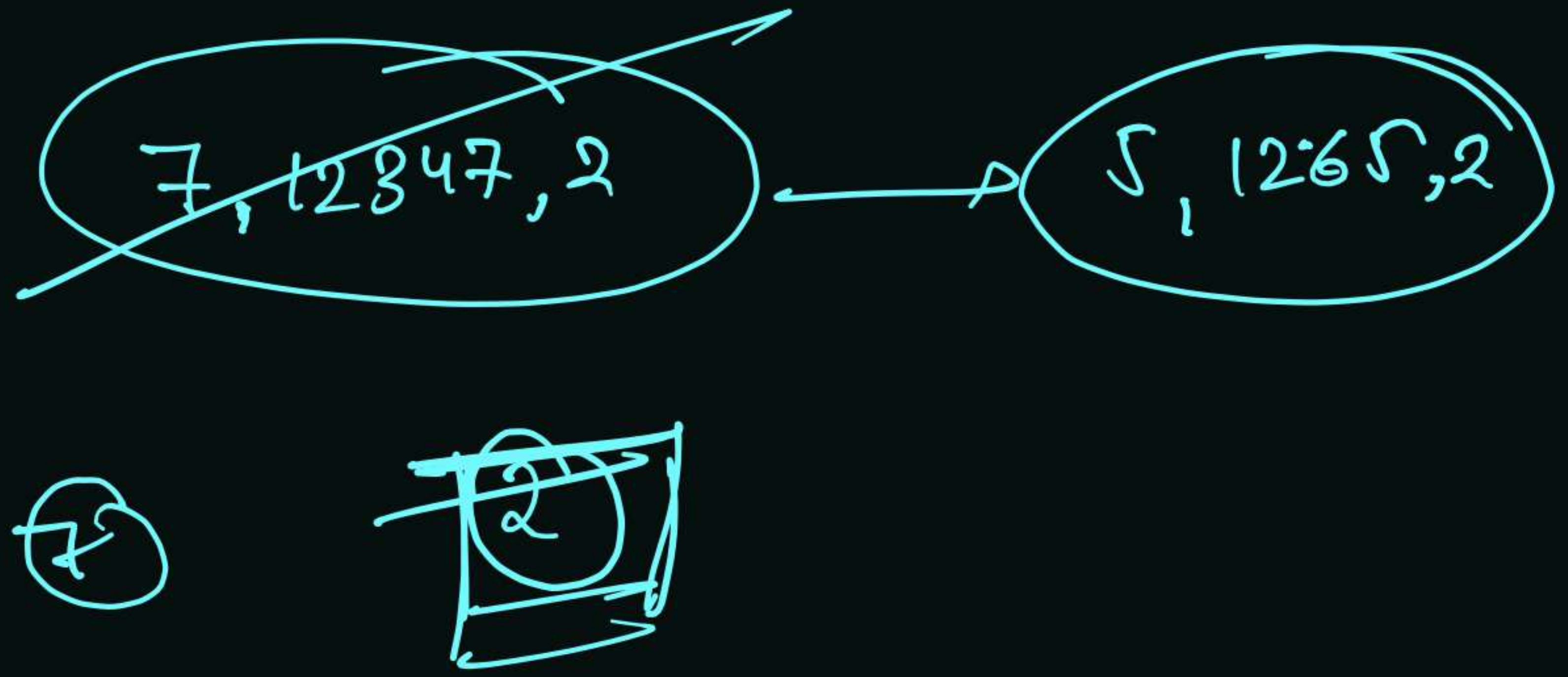


Linked list

vtx, psf, cost so far

y type - addFirst → Remove

y+1 type - addLast



0-1 BFS·