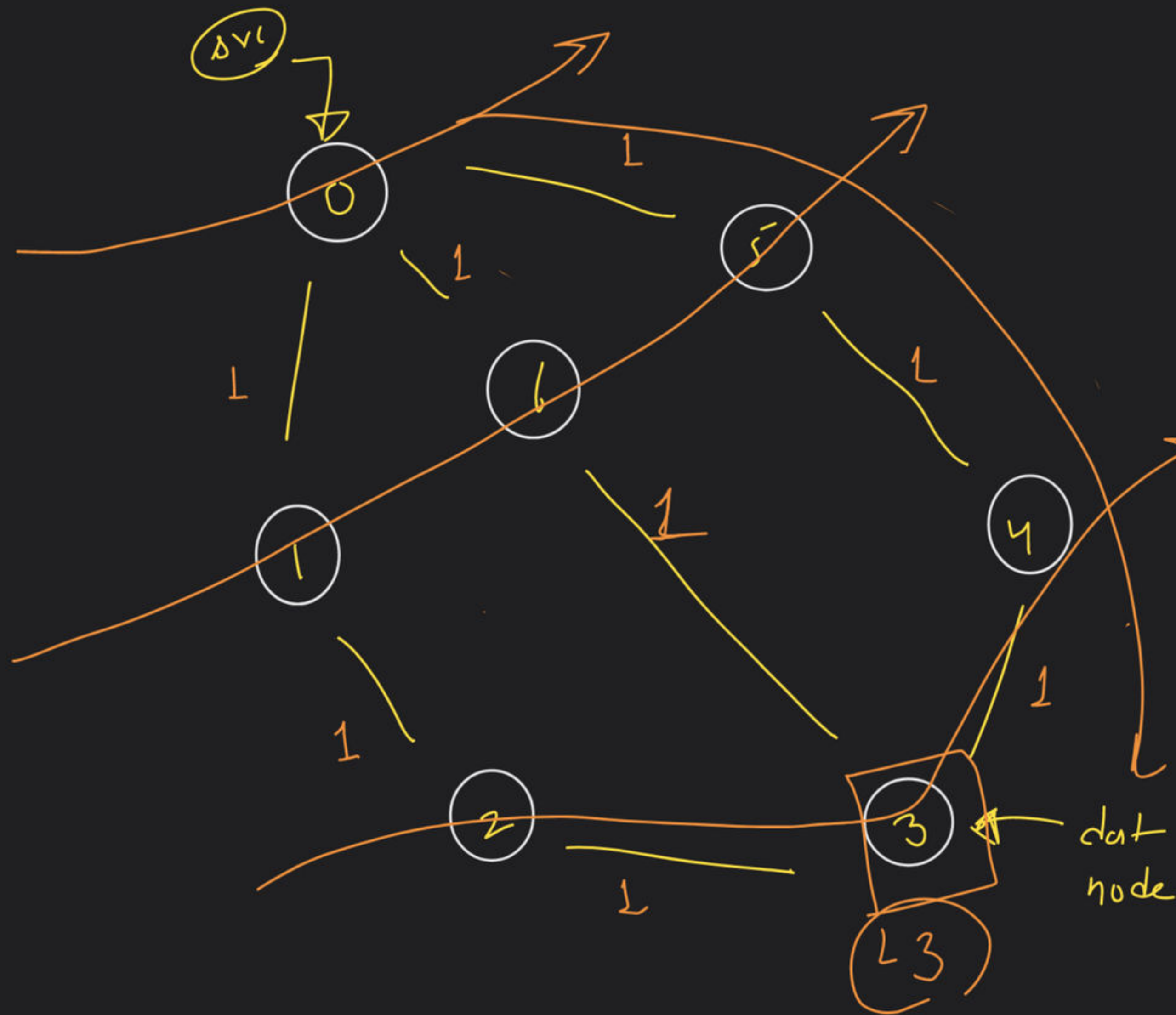




Graphs Class - 4

Special class

→ Shortest Path:-



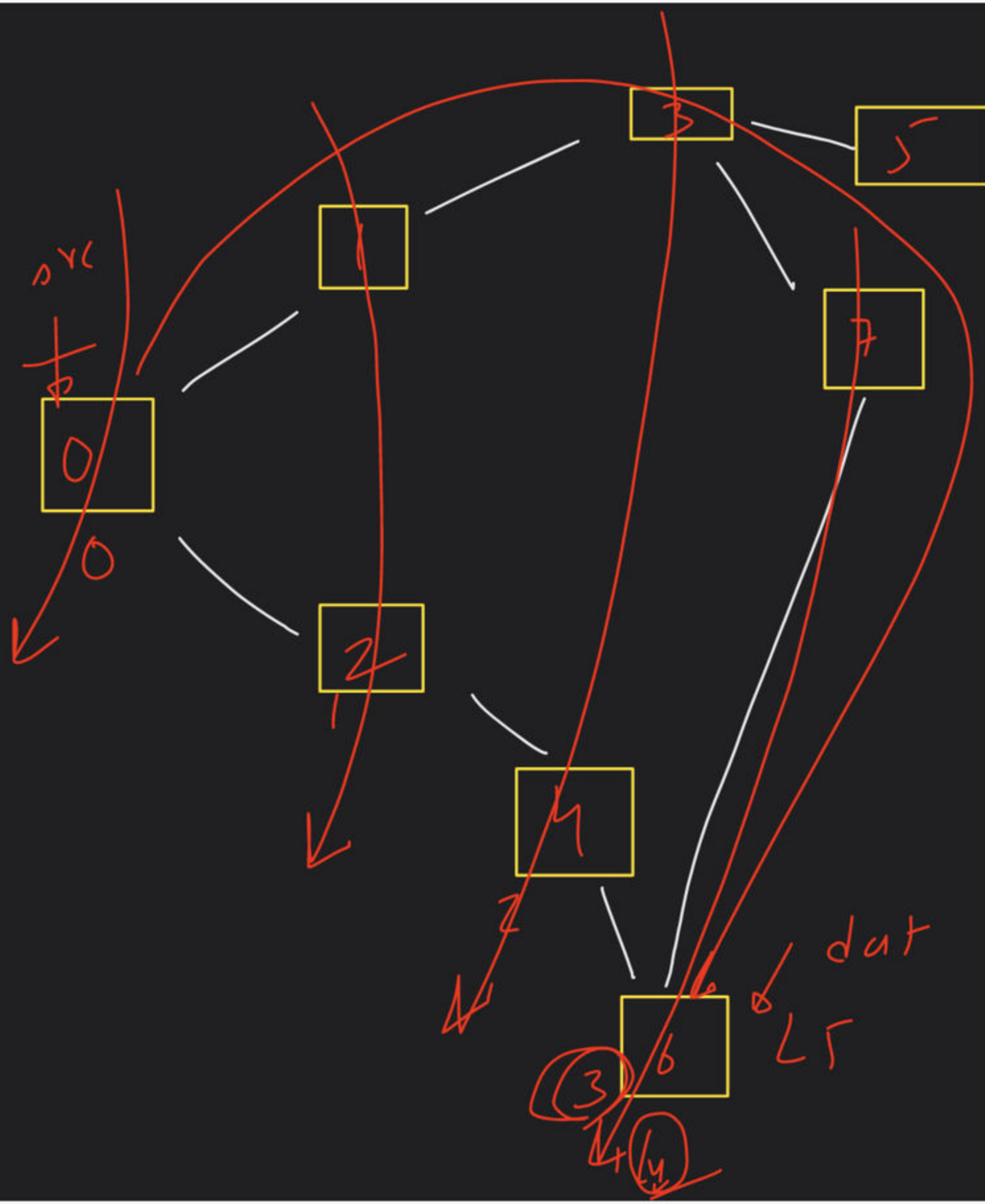
shortest path

0 → 5 → 4 → 3 ✓

0 → 6 → 3 ✓

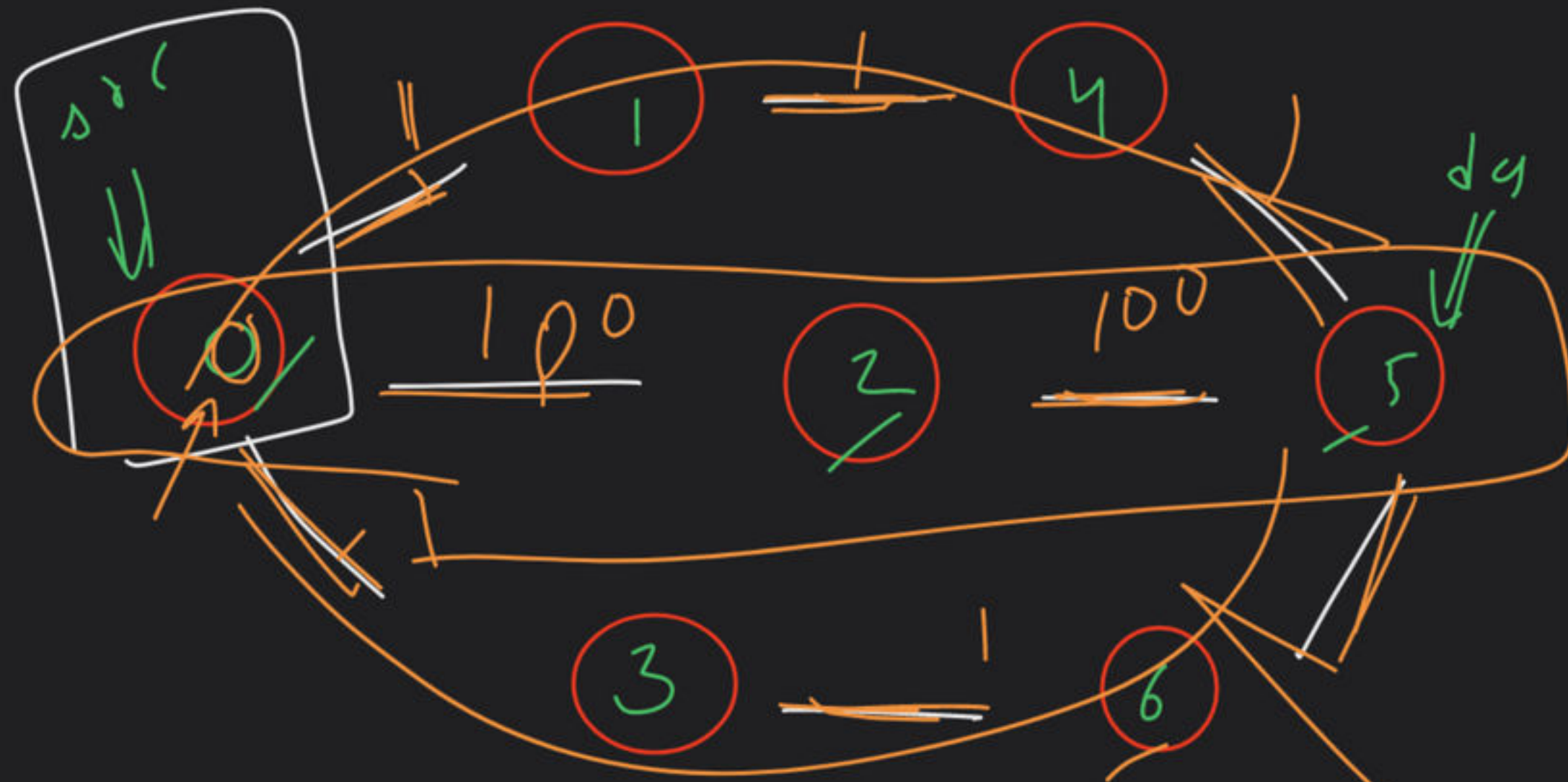
0 → 1 → 2 → 3 ✓

→ final Ans



Bfs

target



parent

0 → -1

1 → 0

2 → 0

3 → 0

4 → 1

5 → 2

6 → 3

visited

0 → ~~F~~ T

1 → ~~F~~ T

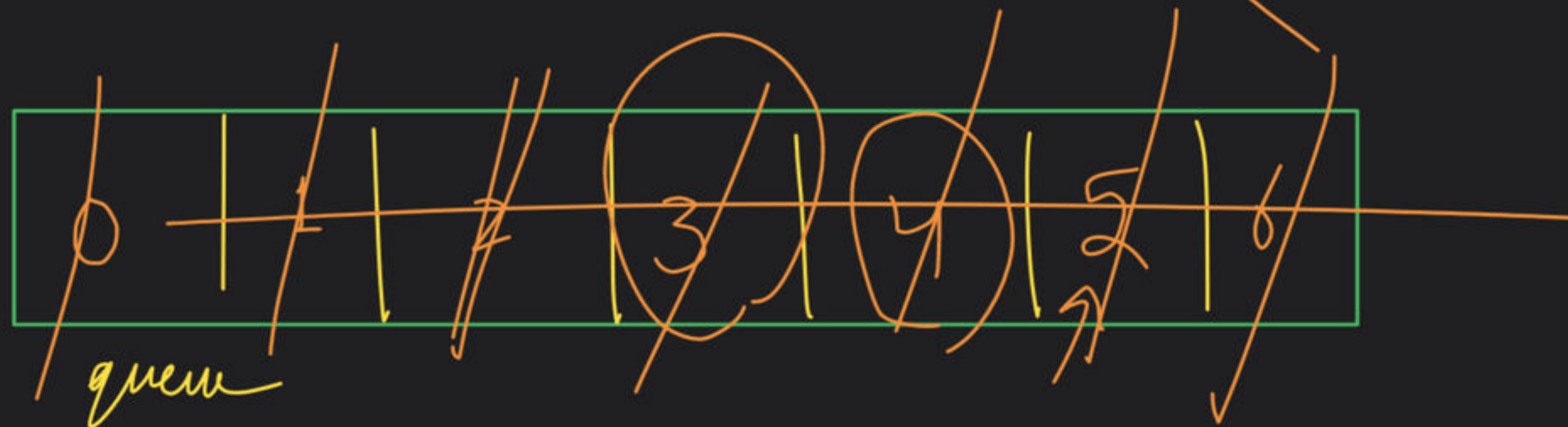
2 → ~~F~~ T

3 → ~~F~~ T

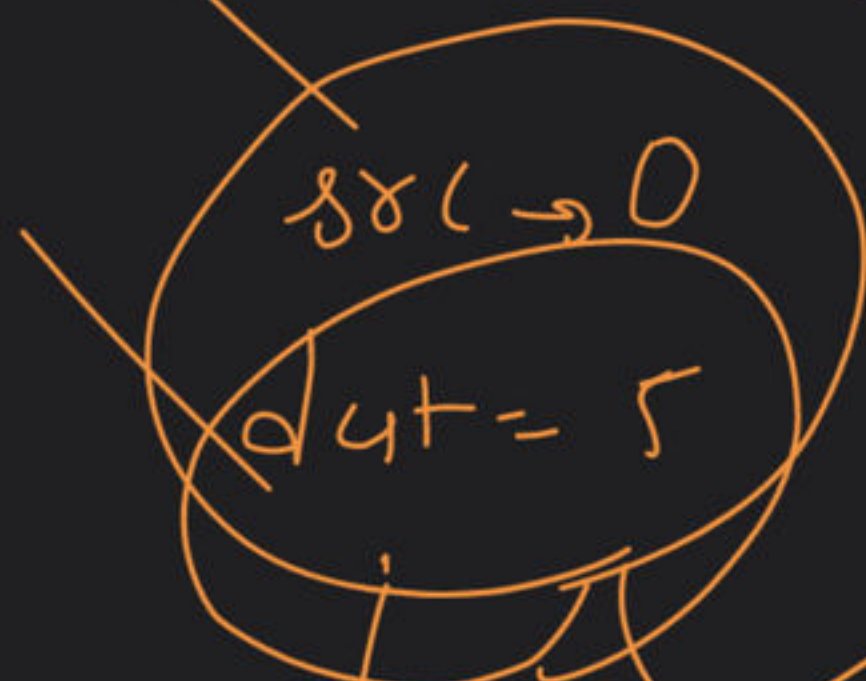
4 → ~~F~~ T

5 → ~~F~~ T

6 → ~~F~~ T



parent



dat

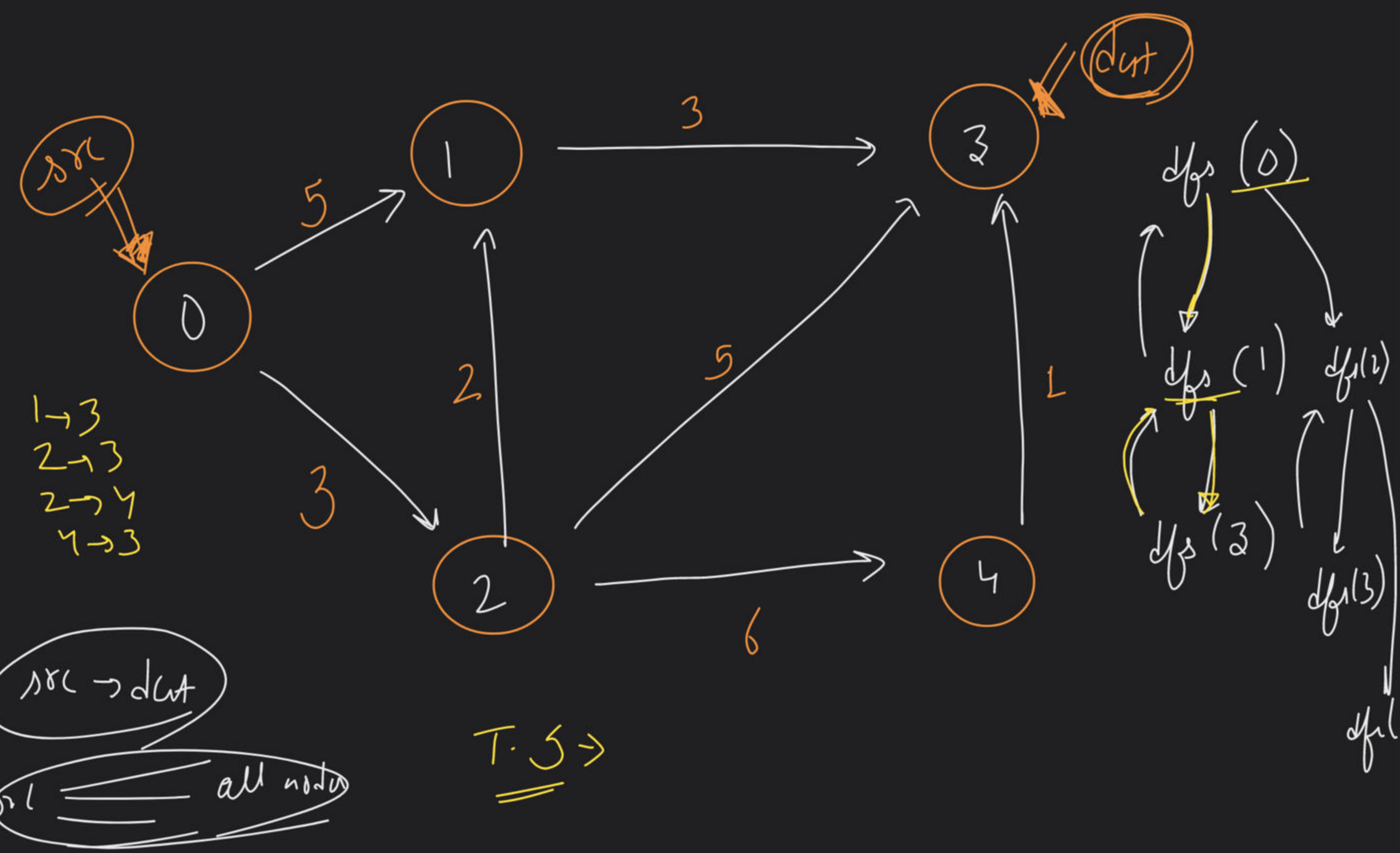
src

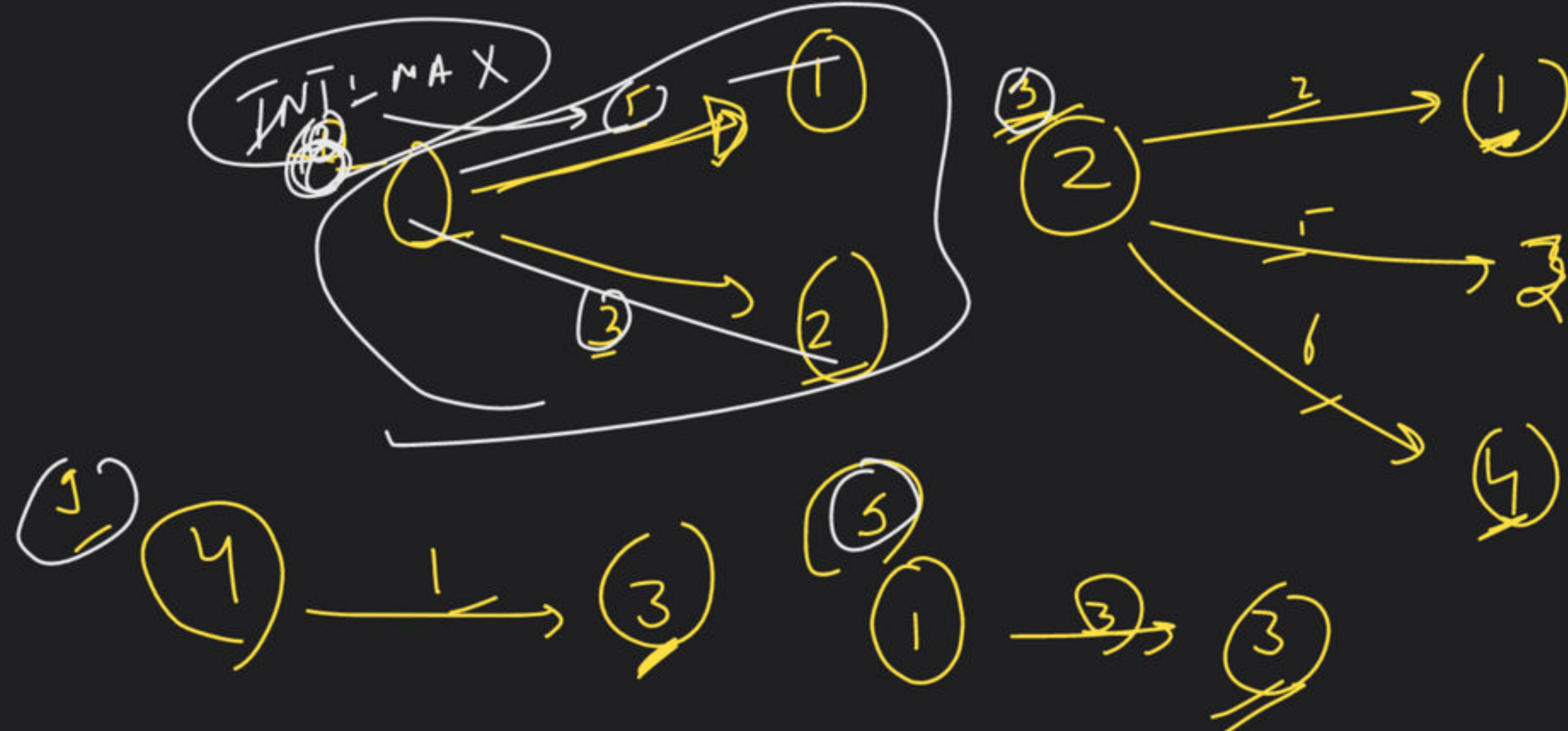
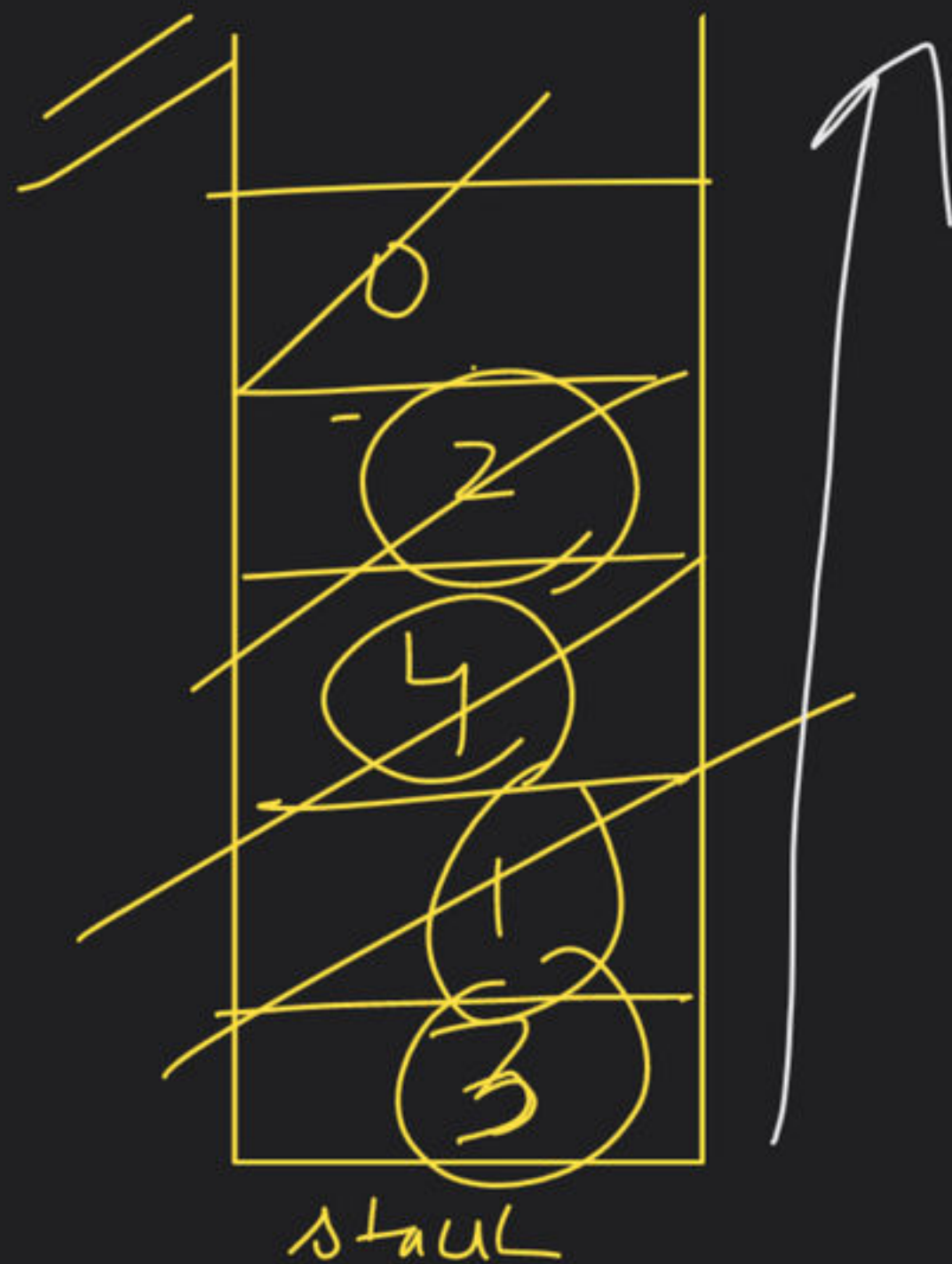


0 → 1
 0 → 2
 2 → 1
 1 → 3
 2 → 3
 2 → 4
 4 → 3

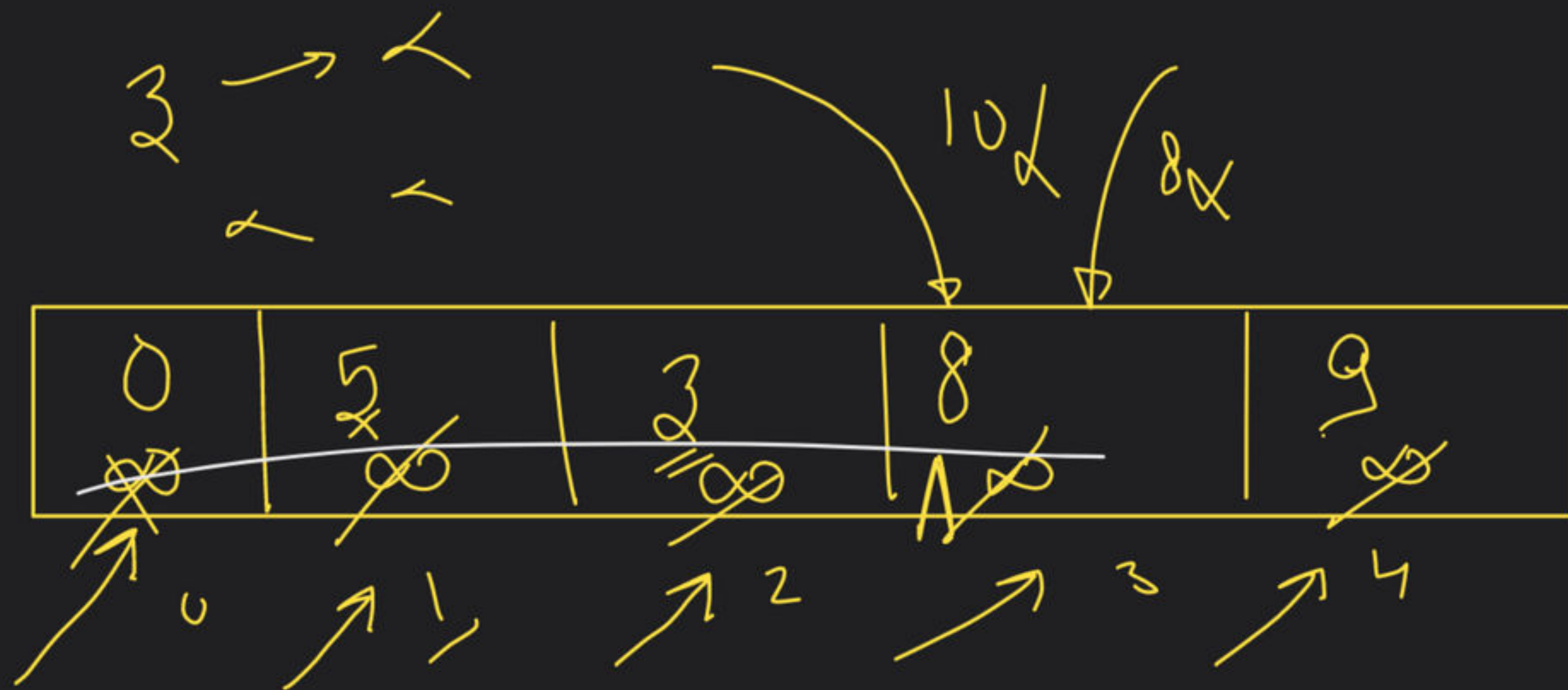
src → dest
 all nodes

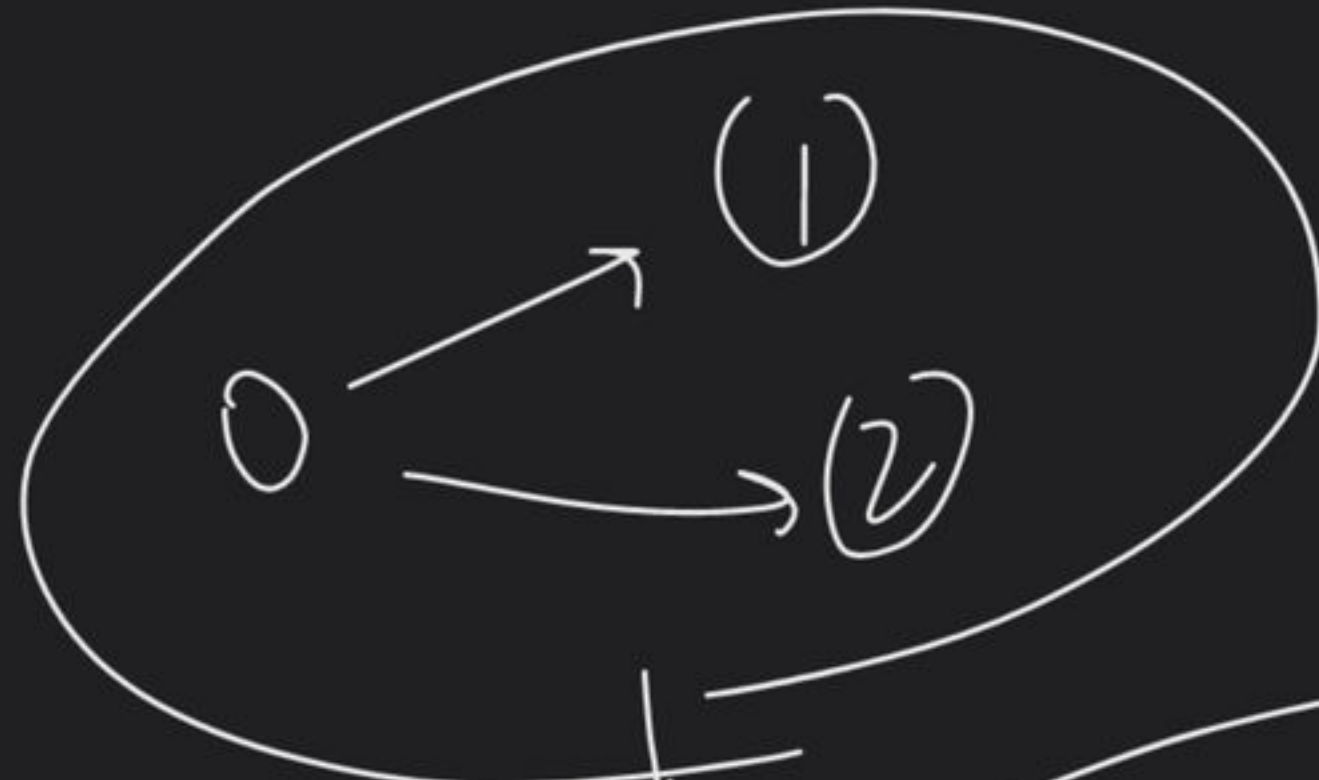
T.S →





distana

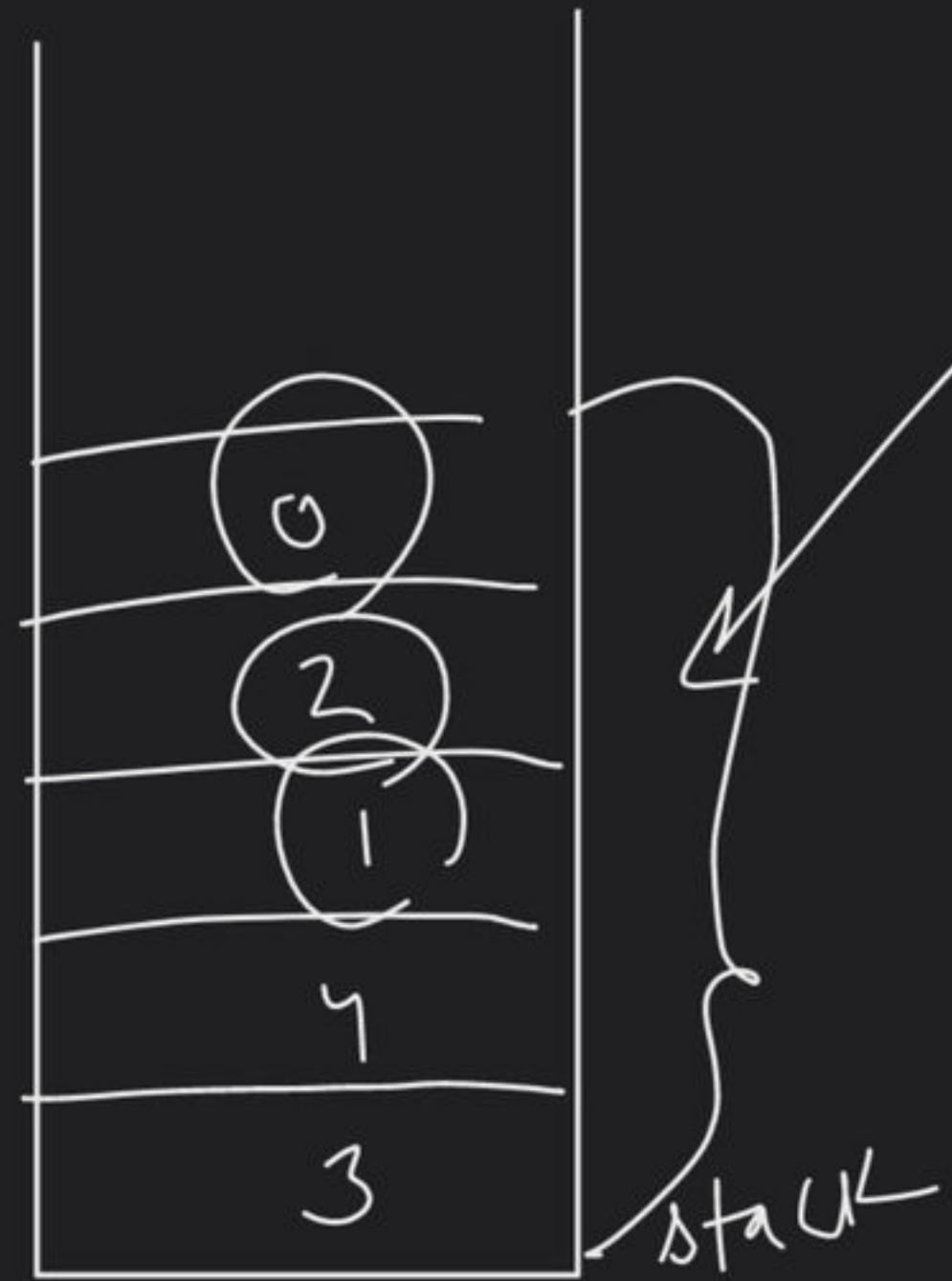




① find Topological Sorting Order

Linear Order

② for each node in stack update the dist array



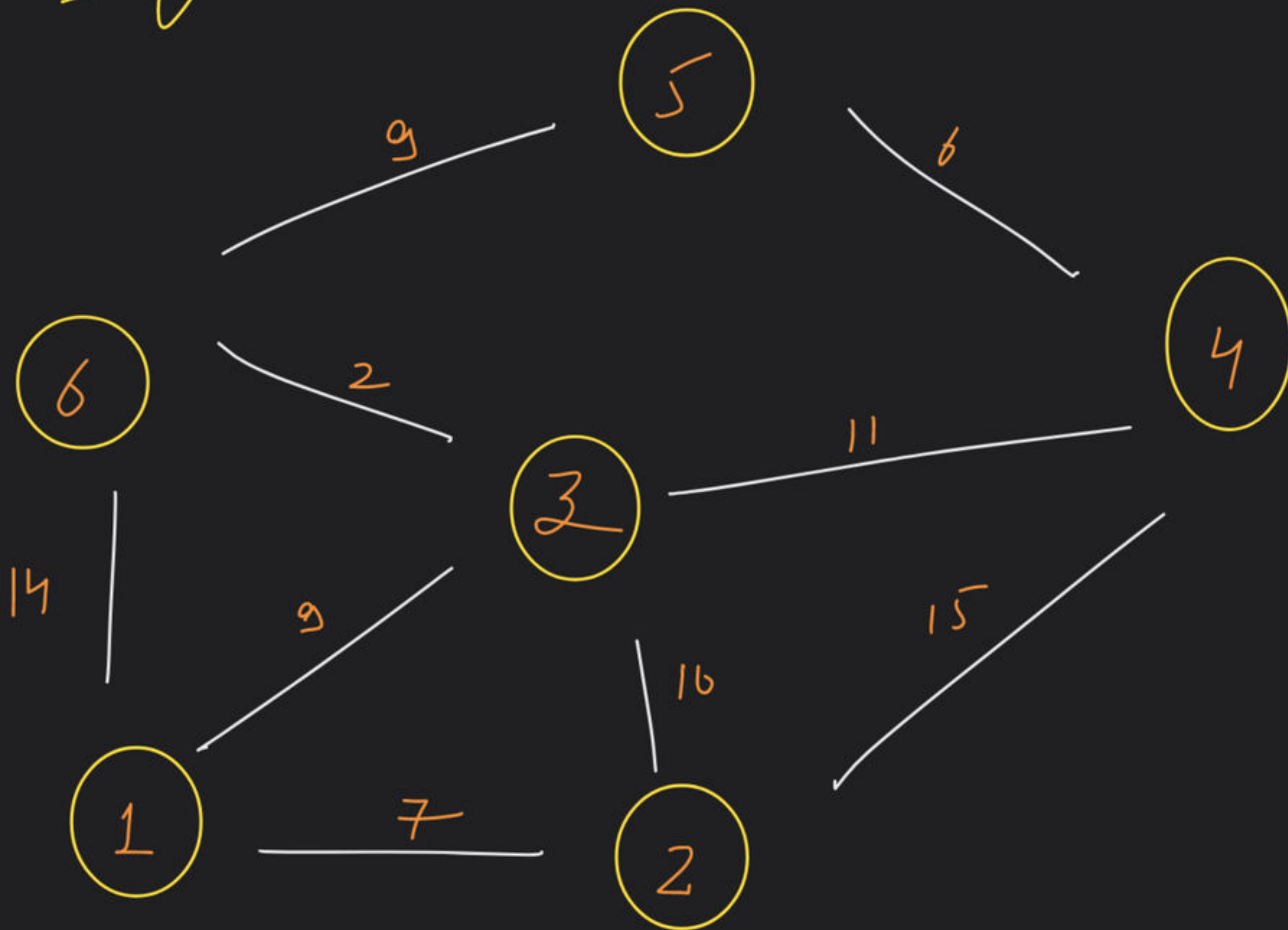
→ Dijkstra algo: -

30 sec

shortest
distance

6 → 4

stl



① minheap
② set



dist

0	1	2	3	4	5	6
∞	11 14	12	9 2	13	9	0

⑤ → src → 6
src dist → 0

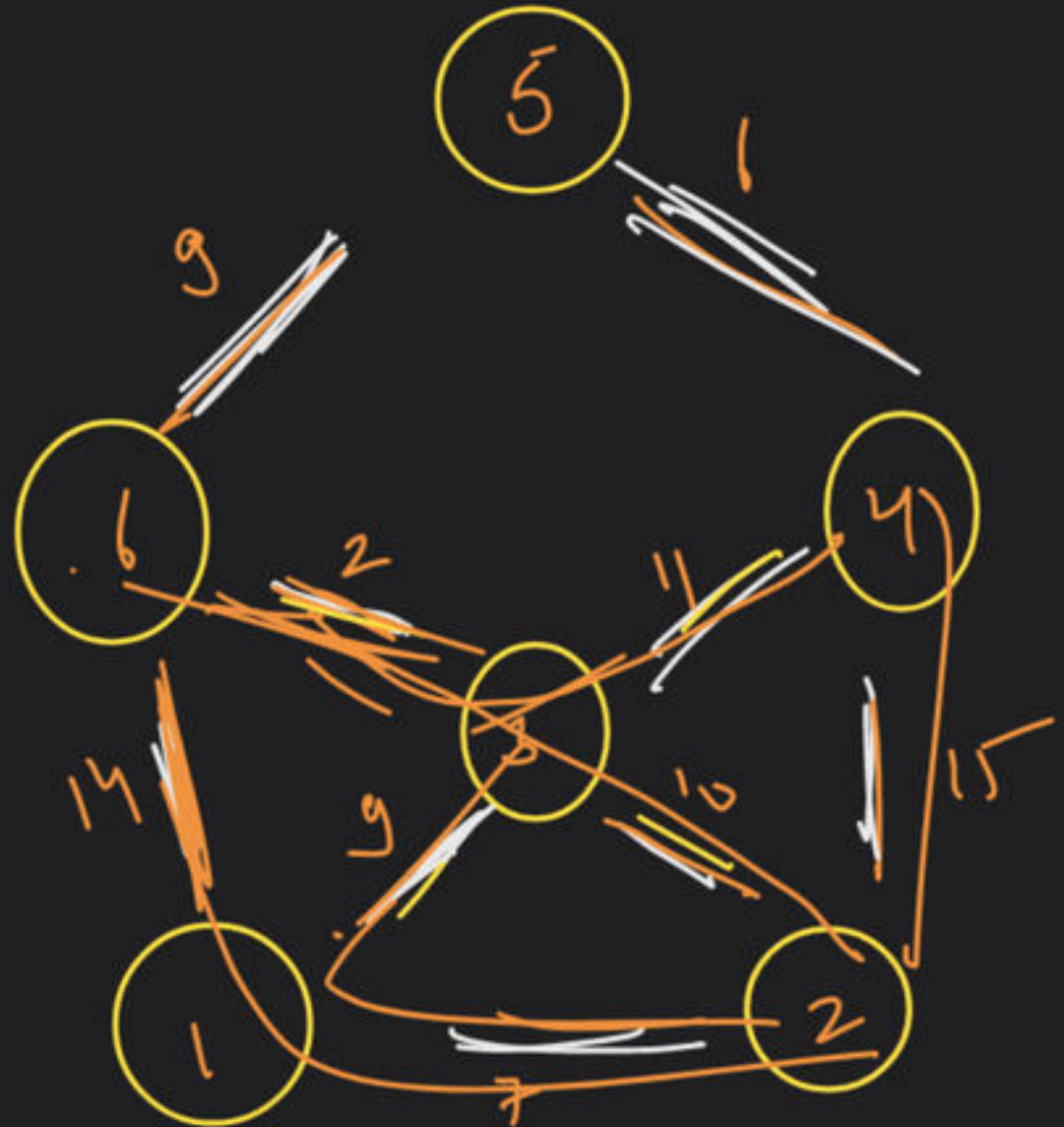
act

element →

node Dist	13	2	9	11	12
node	64	3	8	12	12

(12, 2)
(13, 4)
(5, 5)
(11, 1)
(2, 3)
(0, 6)

crank
↓
(dist, node)



0	1	2	3	4	5	6
∞	11	12	2	13	9	0

~~set~~

last split

element $\Rightarrow (0, 6)$

node distance $\rightarrow 0$

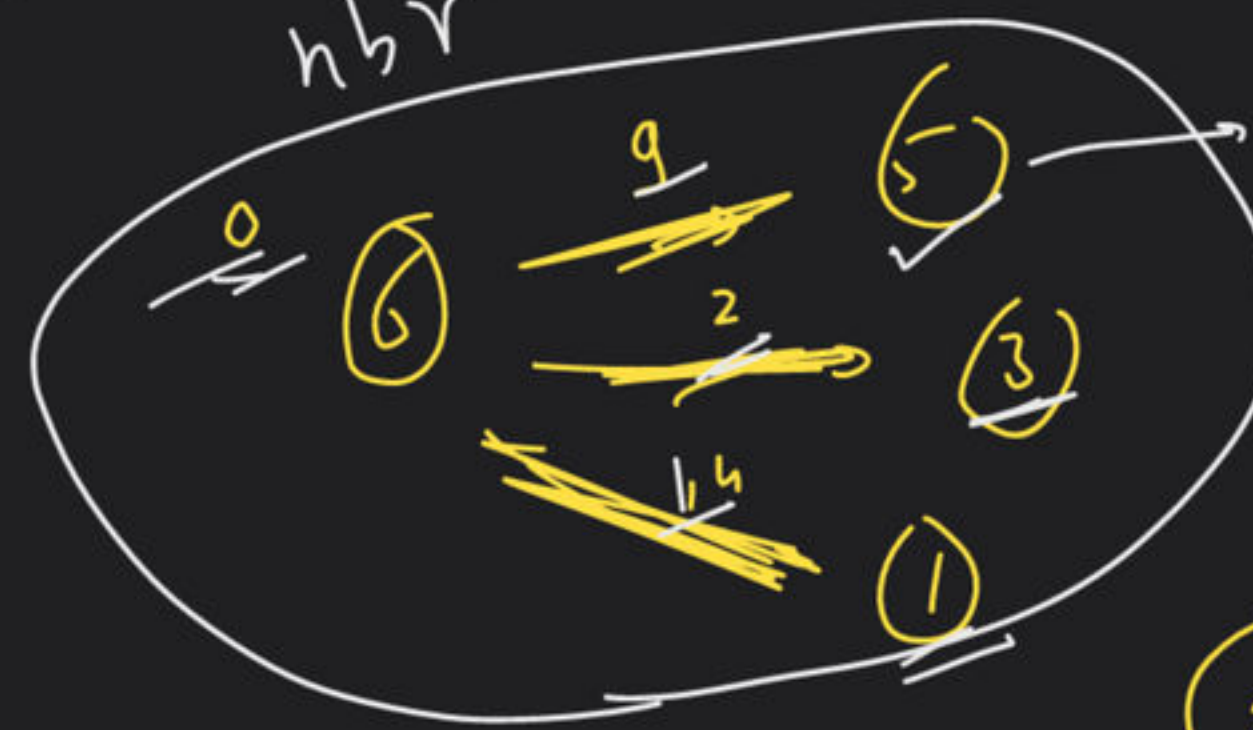
node $\rightarrow 6$

dist $\rightarrow 2, 3$

node dist $= 2$

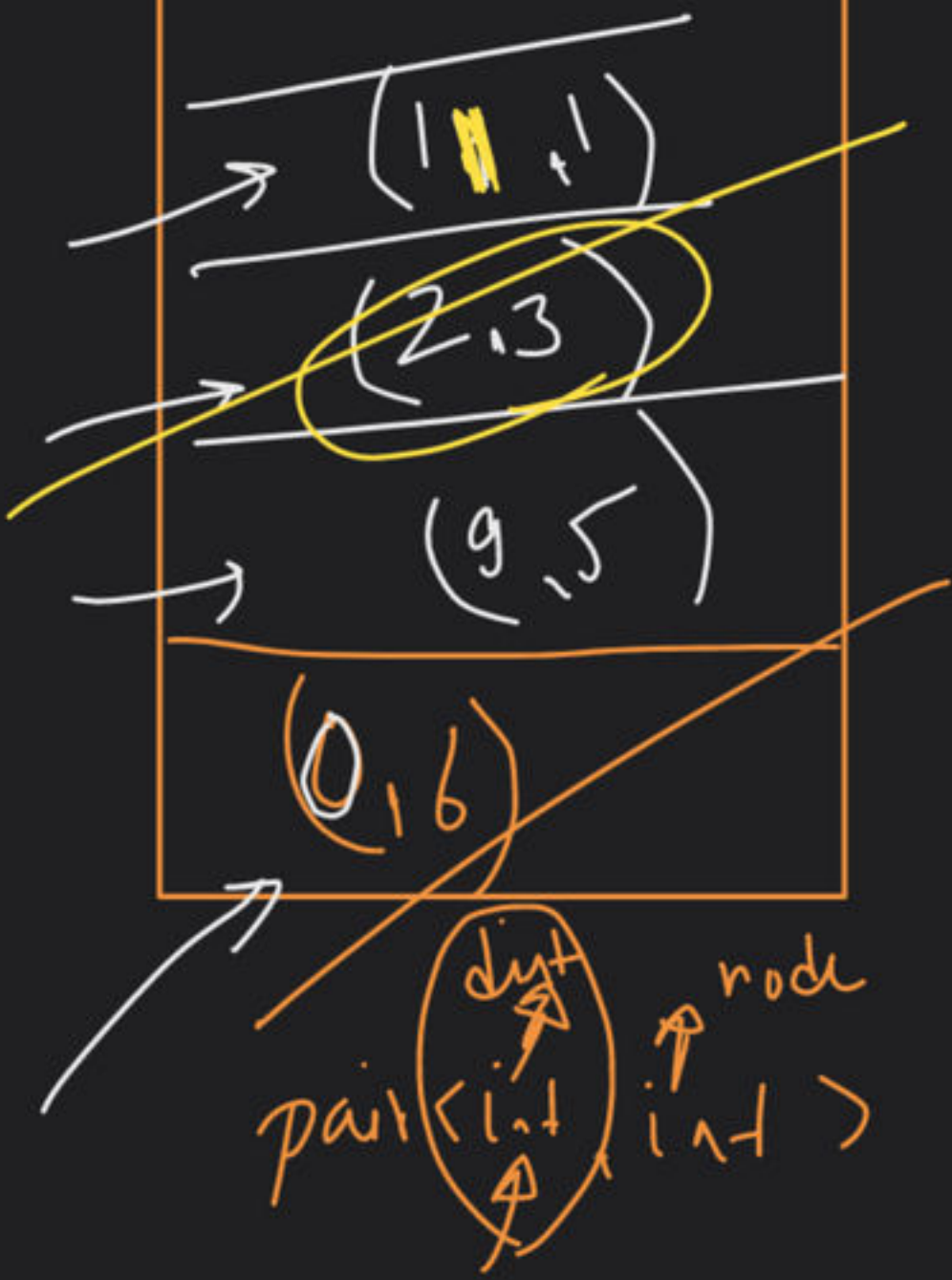
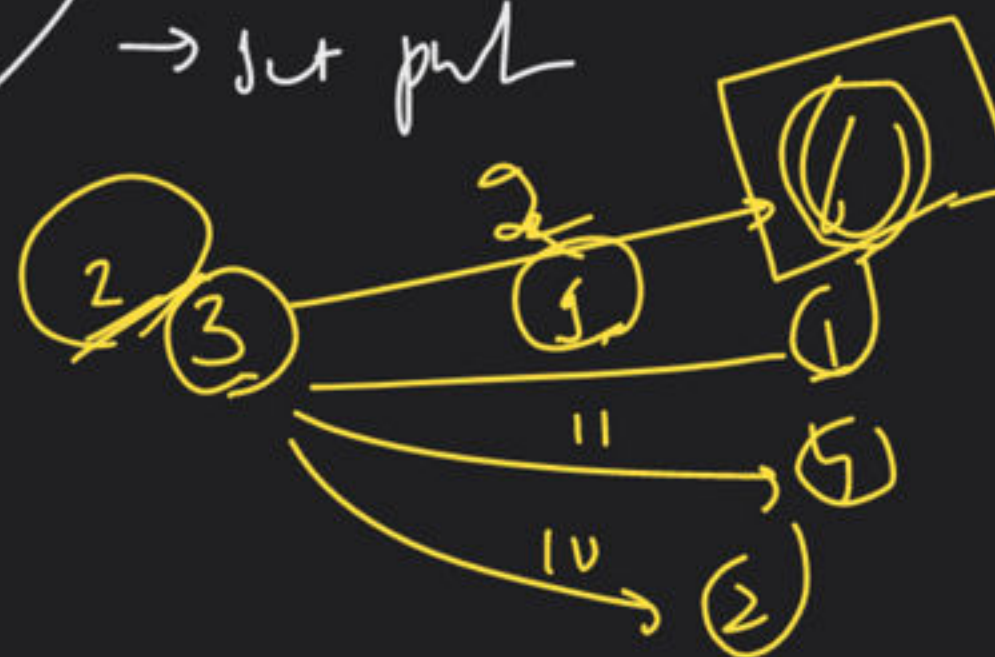
node $= 3$

hbr



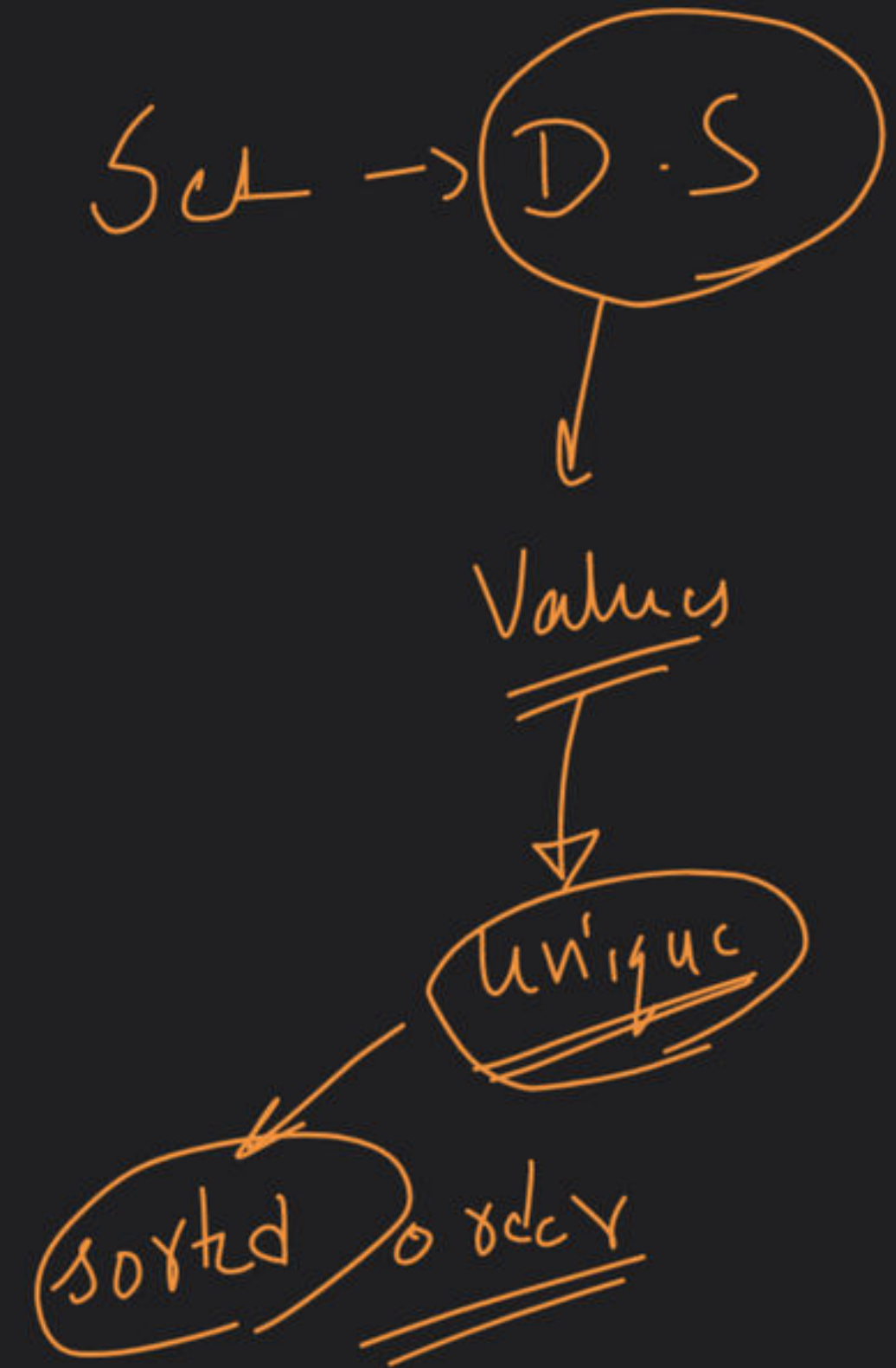
$\tau \rightarrow 9$

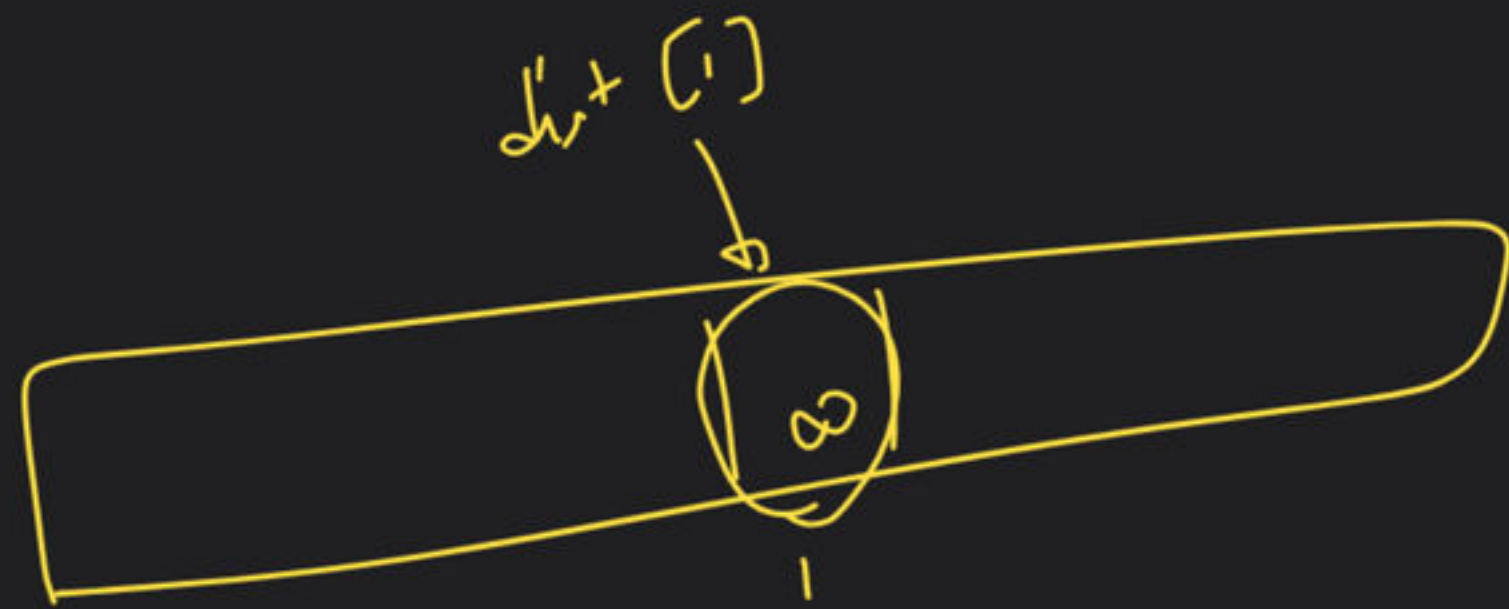
distance
 \rightarrow set path



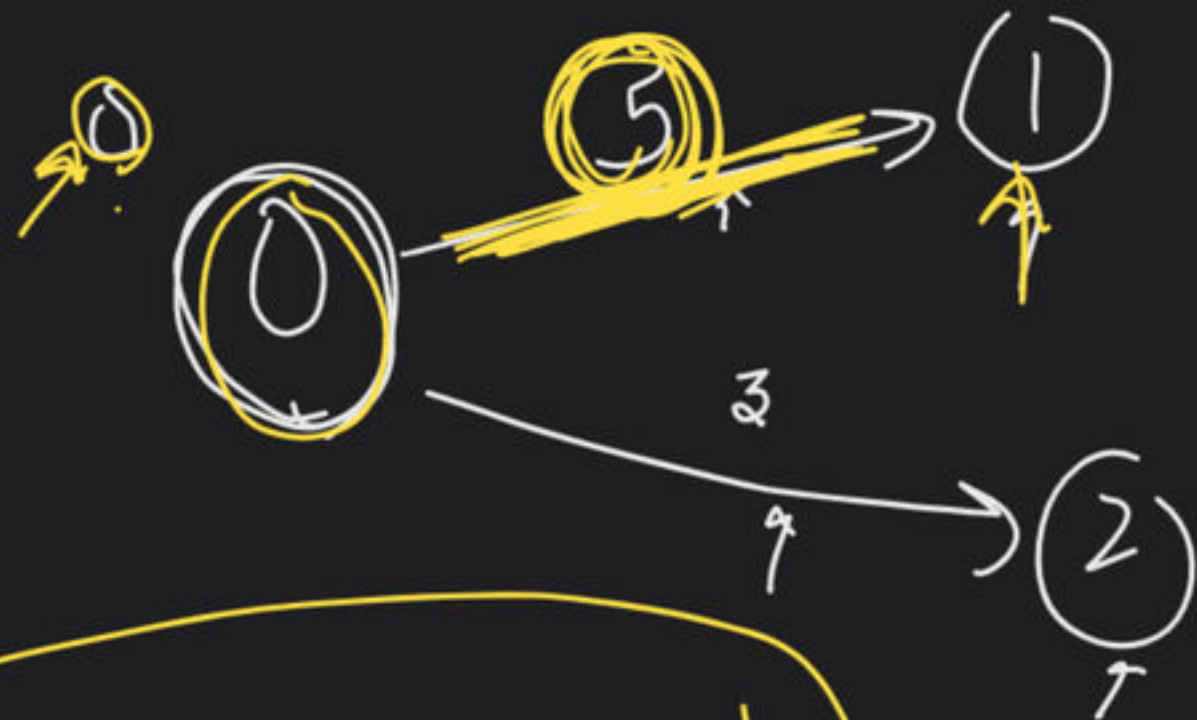
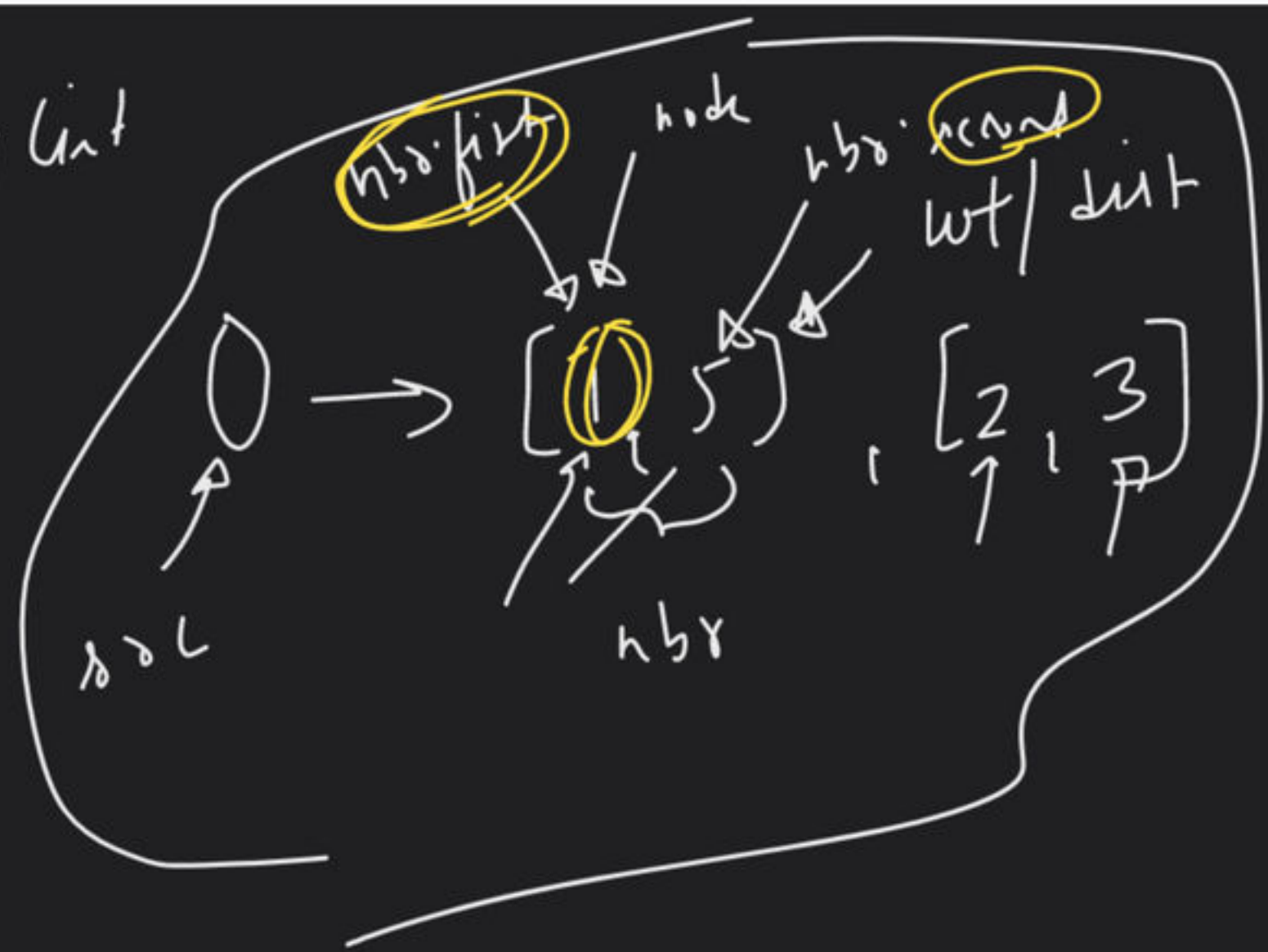
$(0, 6)$
 $(0, \infty)$
 $(dist, node)$

∞	∞	∞	∞	∞	∞	∞
0	1	2	3	4	5	6





adj list



$$dist[element] + \text{nbr} \cdot \text{second} < dist[\text{nbr} \cdot \text{first}]$$

$$0 + 5 \leq dist[i]$$

$$dist[i] = 0 + 5$$

$$dist[\text{nbr} \cdot \text{first}] = \dots$$