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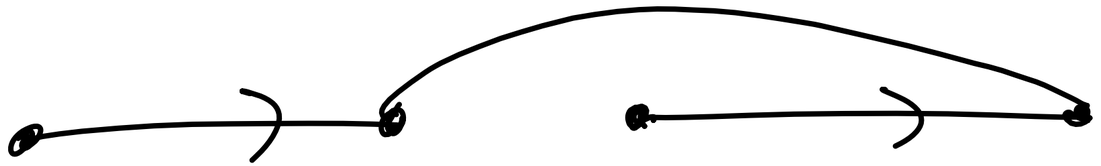
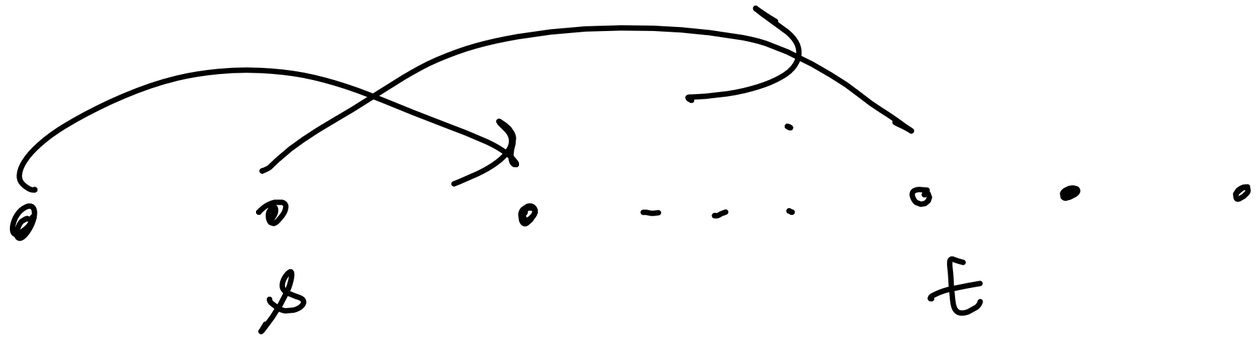
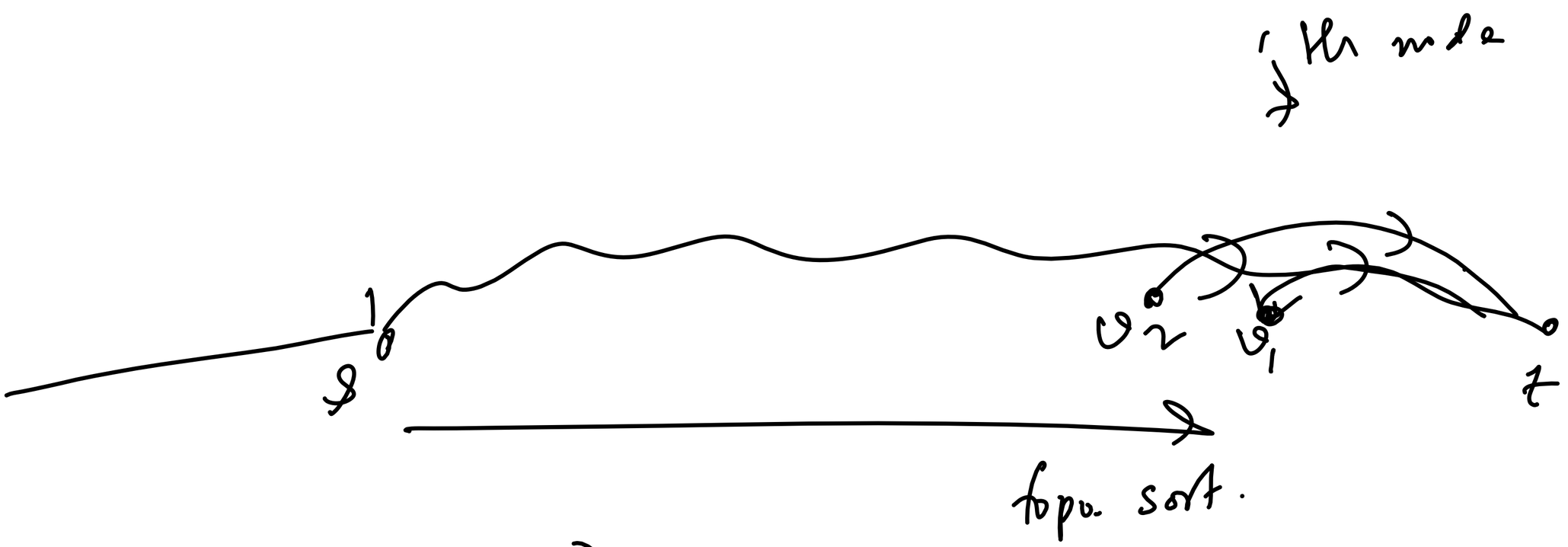
3.22



3.23



# of different paths from s to t.



DP[j] ← # paths from s to j

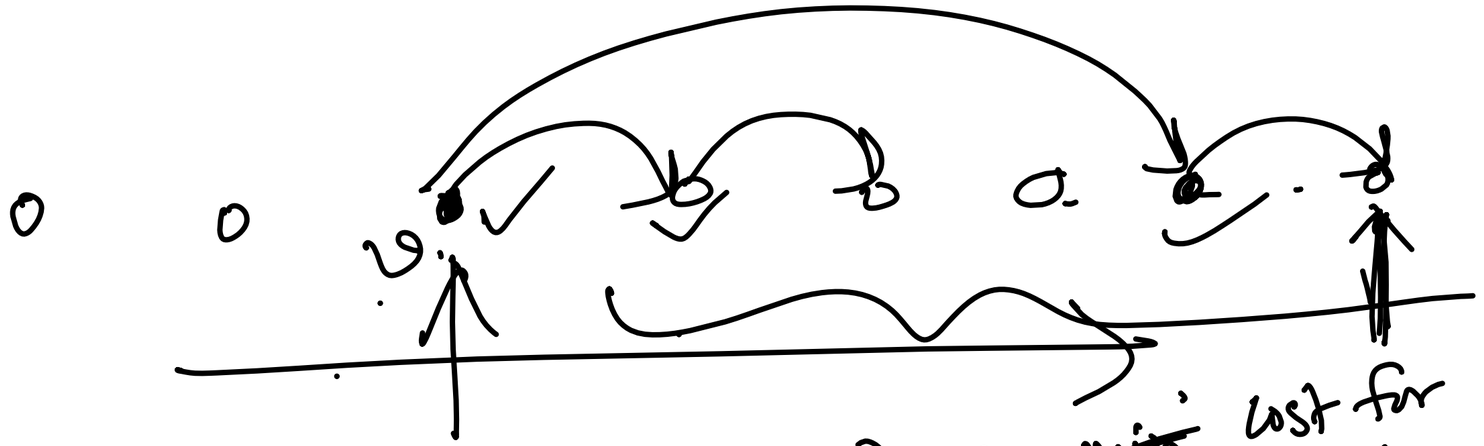
DP[t] ← DP[v_1] + DP[v_2]

where (v_1, t) (v_2, t) are only parents of t.

O(n)

A path that touches all vertex exactly once.

3.25.

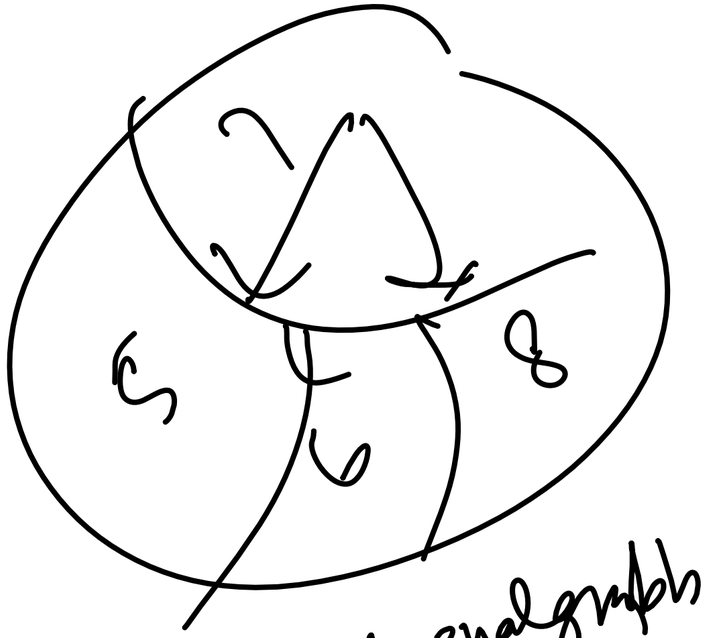


$DP[i] \leftarrow$ ~~min~~ cost for node i

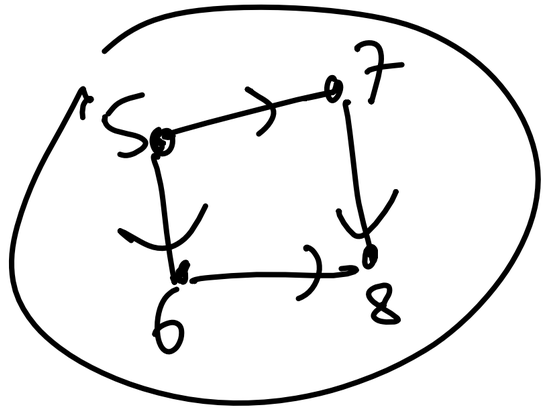
$\leftarrow \min_{\text{s.t. } (j,v) \in E} \{ DP[v], \text{Price}[j] \}$

Total cost $= \sum_{v \in V} O(E) = O(E)$.

build this DP from right to left.



Original graph

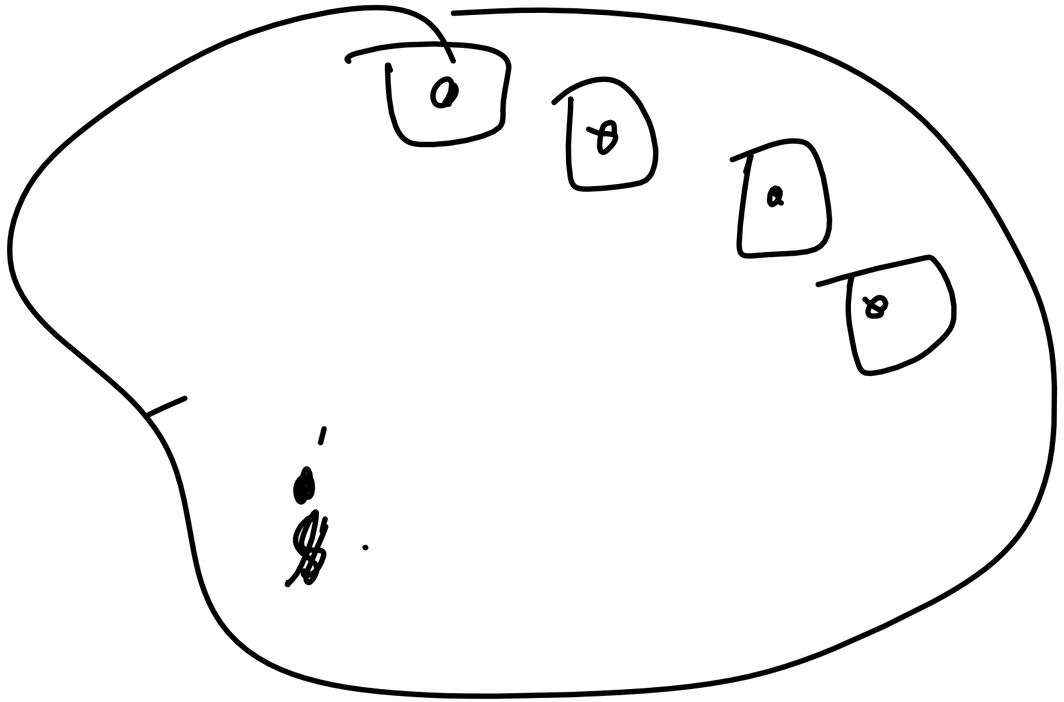


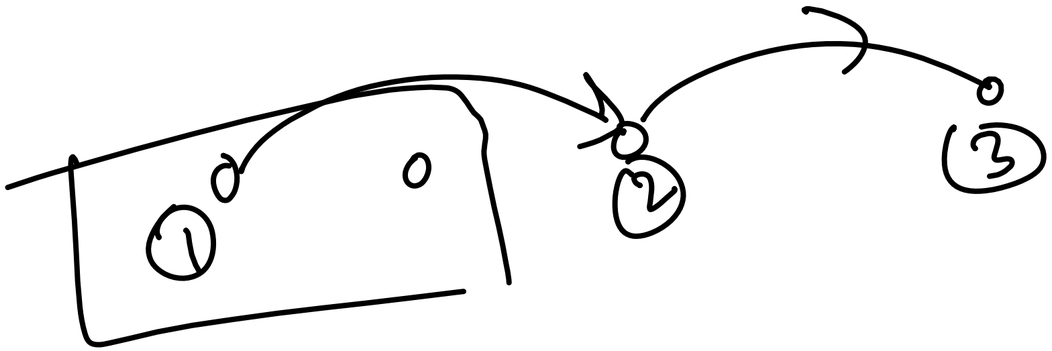
DAG.

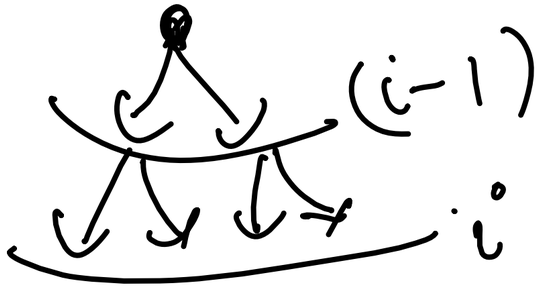
(a, b, c)

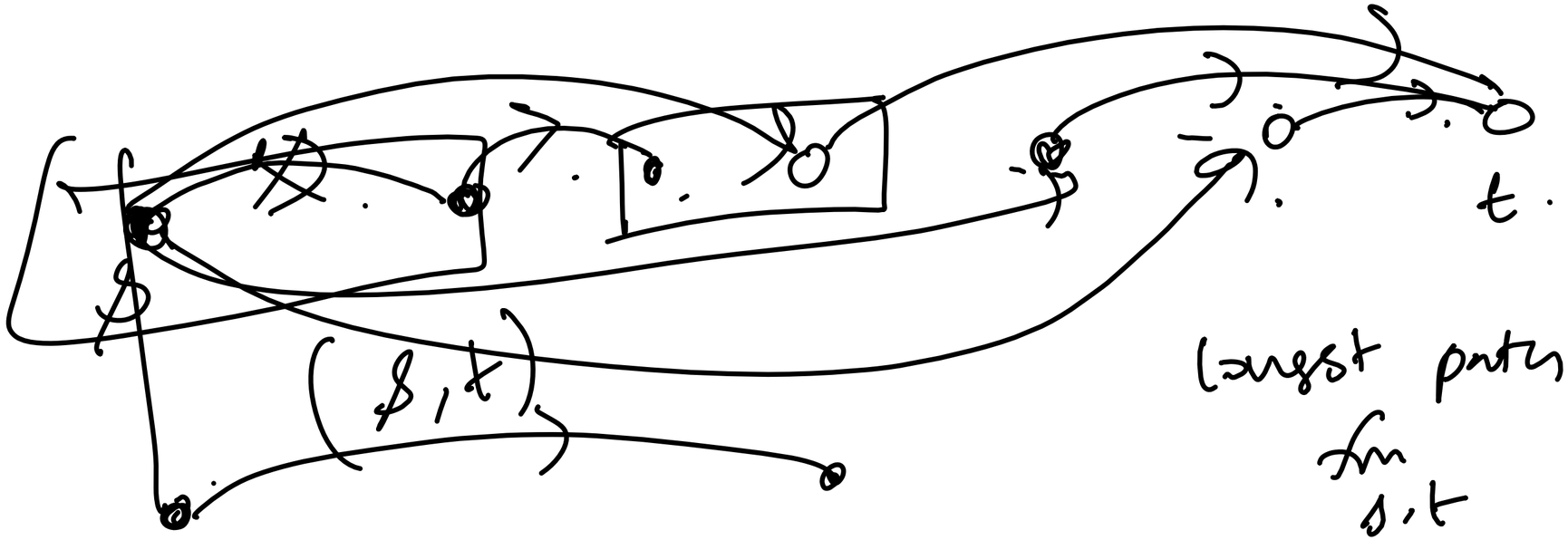
Source node: $(0, 7, 4)$.

Destination: all (a, b, c) where $b = 2$ or $c = 2$.



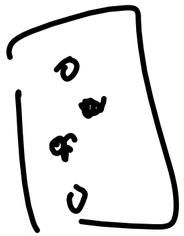


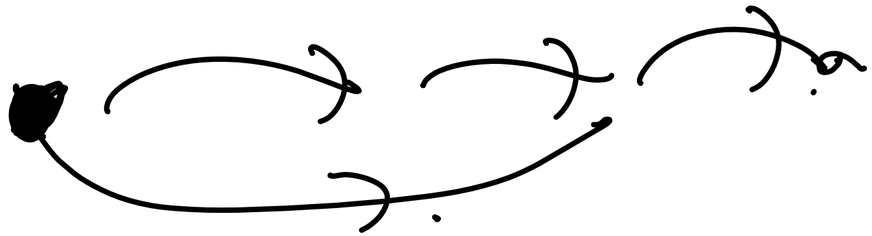




longest paths for s,t

BFS starting for sources i





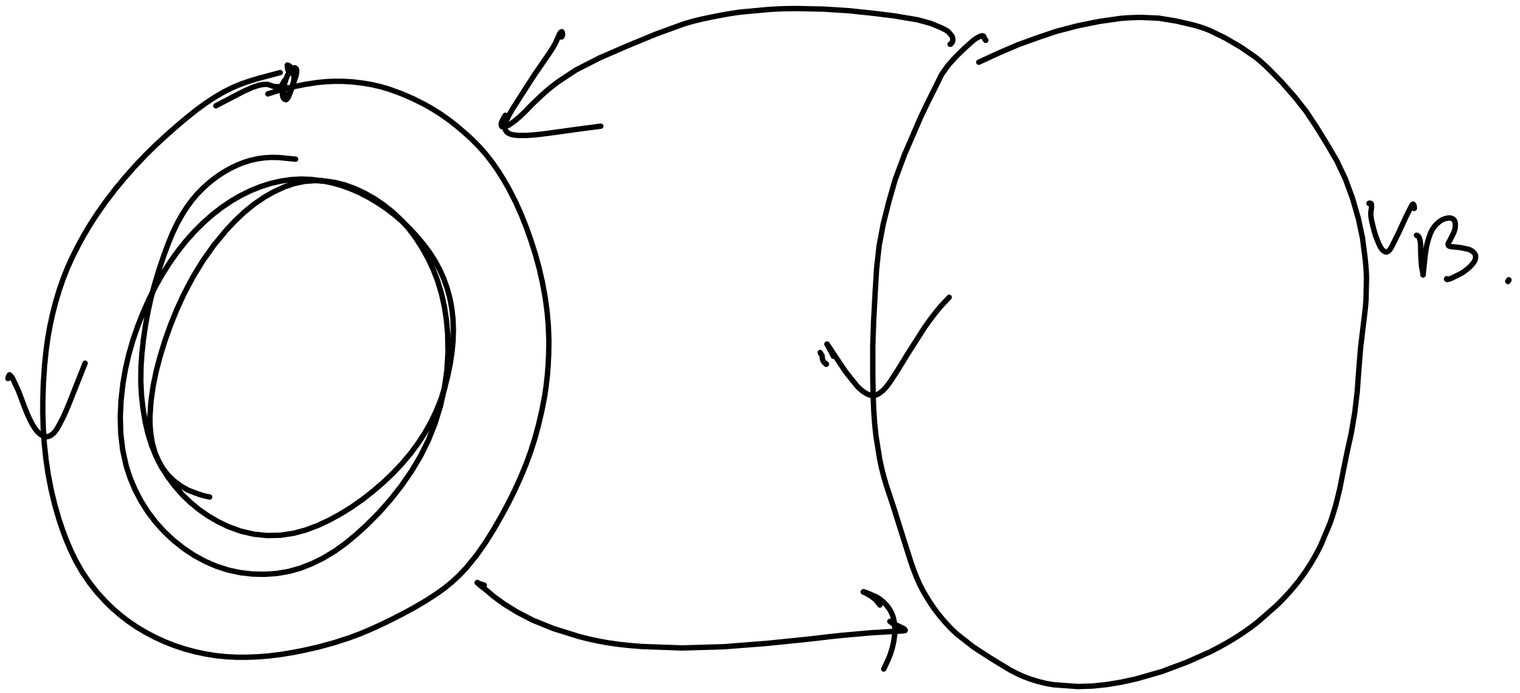
3.17 b :

s has to reach a SCC having ≥ 2 nodes.

A_i's are reachable SCC for s's SCC.

Meta graph

$$|V_{G_{meta}} \cap A_i| \geq 1$$


V_B.

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