Extra Examples

These are all Directed Graphs.

Run DFS and BFS on the following graph starting at vertex 0.

0	1, 3
1	0, 2, 4
2	3, 4
3	0, 2, 4
4	1, 3

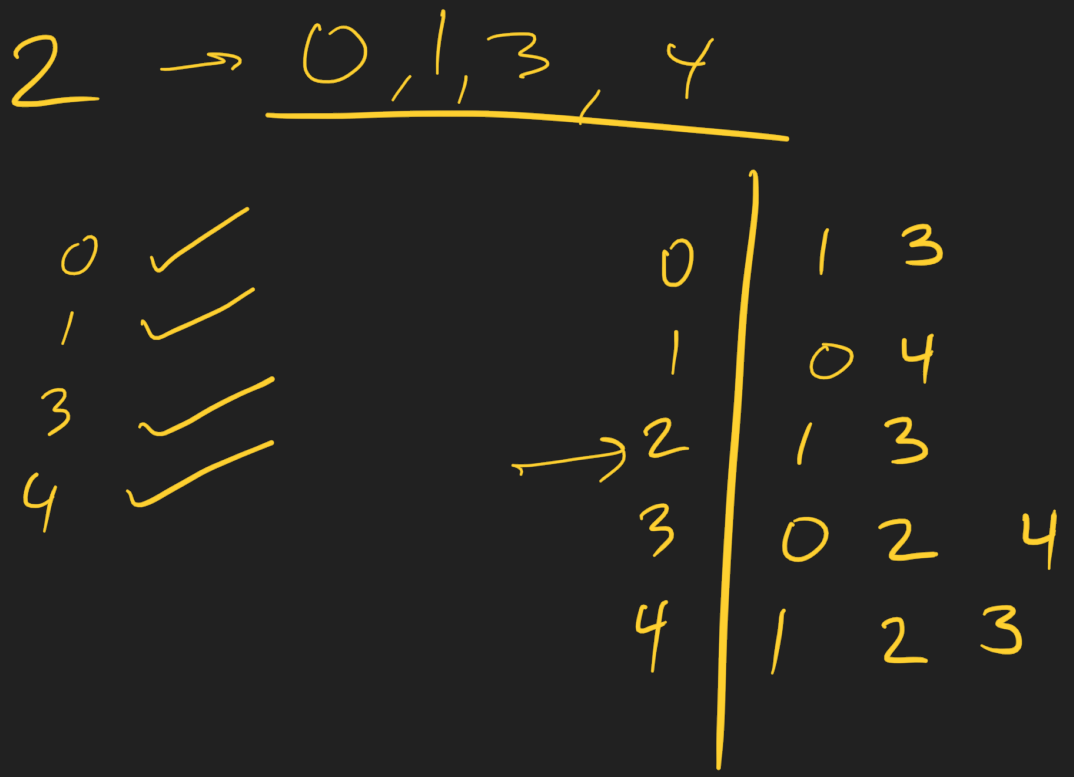
DFS: 0-1-2-3-4

BFS: 0-1-3-2-4

Q: 0 1 3 2 4

Determine if the graph below is strongly connected. If it is not, determine any strongly connected components of the graph.

0	1, 3
1	0, 2, 4
2	3, 4
3	0, 2, 4
4	1, 3



Find all the topological orderings of the graph below.

0	1, 3
1	2, 4
2	3, 4
3	
4	3

0
1
2
4
3

1

Determine if the following graph could be the transitive closure of another graph and if so, describe the original graph.

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

0 :

1 : 0, 1, 2, 3, 4

2 : 0, 1, 2, 3, 4

3 :

4 : 0, 1, 2, 3, 4

Determine if the following graph could be the transitive closure of another graph and if so, describe the original graph.

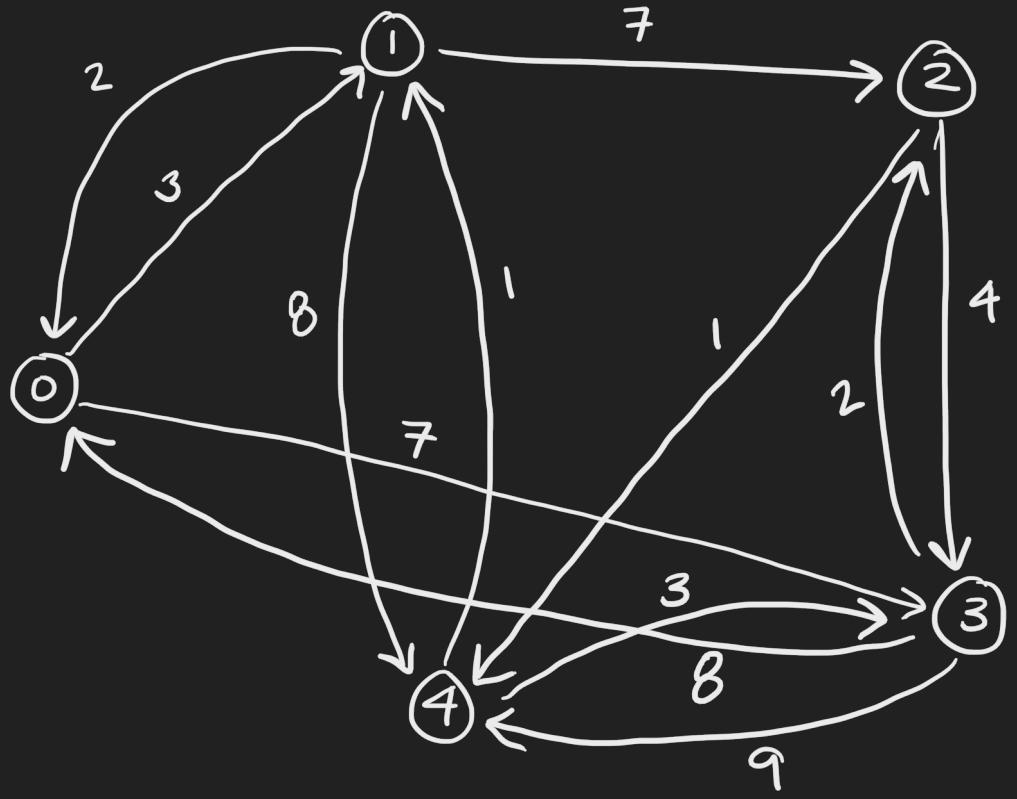
0	0	1	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	1	0	0	0

Determine if the following graph could be the transitive closure of another graph and if so, describe the original graph.

0	1	1	0	0
1	1	0	0	0
1	0	0	0	1
0	0	0	1	1
0	0	1	1	0

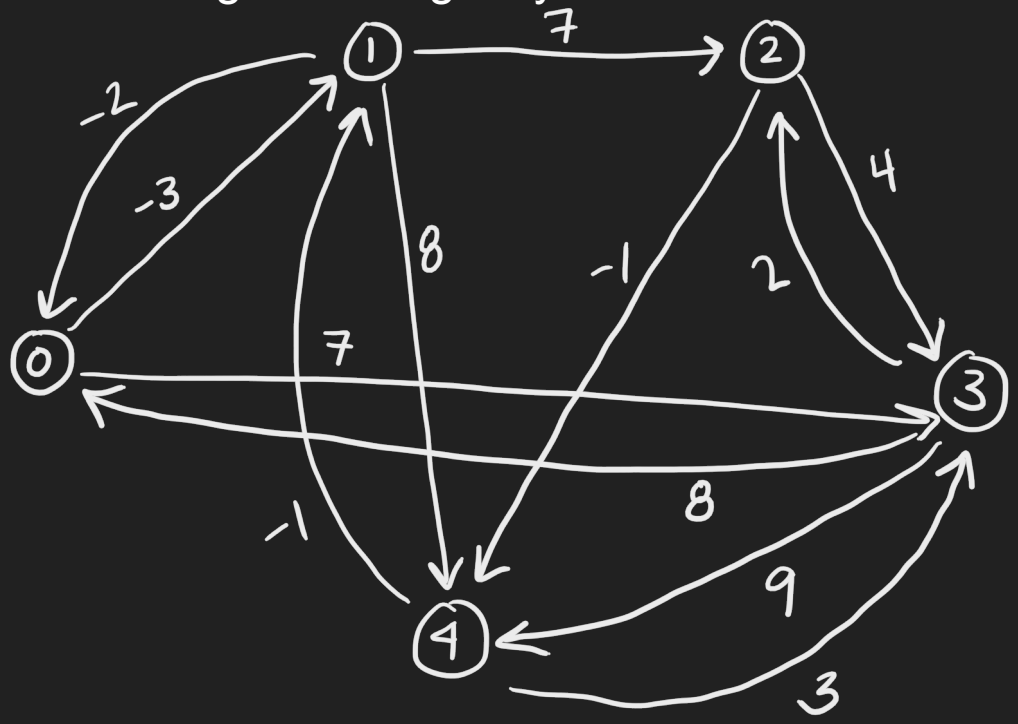
Run Dijkstra's Algorithm on the graph below starting at vertex 0. The edges are given in the adjacency list as (v, w) where v is the endpoint and w is the weight.

0	(1, 3), (3, 7)
1	(0, 2), (2, 7), (4, 8)
2	(3, 4), (4, 1)
3	(0, 8) (2, 2), (4, 9)
4	(1, 1), (3, 3)



Run the Bellman-Ford Algorithm on the graph with the source at vertex 0. The edges are given in the adjacency list as (v, w) where v is the endpoint and w is the weight. Does the graph have a negative weight cycle?

0	(1, -3), (3, 7)
1	(0, -2), (2, 7), (4, 8)
2	(3, 4), (4, -1)
3	(0, 8) (2, 2), (4, 9)
4	(1, -1), (3, 3)



Run the DAG-based shortest path algorithm on the graph below. The edges are given in the adjacency list as (v, w) where v is the endpoint and w is the weight.

0	(1, 1), (3, -2)
1	(2, -1), (4, 0)
2	(3, 2), (4, 1)
3	
4	(3, 5)

Run the All-Pairs Shortest Path Algorithm on the graph below. Note that “I” stands for “infinity.”

I	2	I
5	I	1
I	3	I