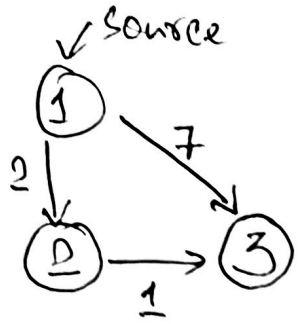
Floyd Warshall Alg.

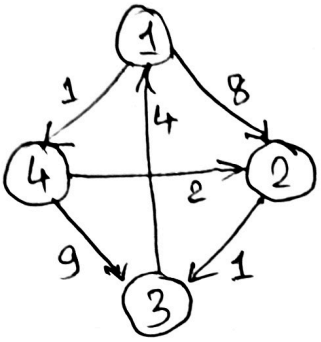
use floyd warshall alg to find the shortest path between every pair of vertices in the following graph.



$1 \longrightarrow 3 = 7$

$1 \rightarrow 2 \rightarrow 3 = 3$

Solution: Initial distance matrix.



D_0:

	1	2	3	4
1	0	8	∞	1
2	∞	0	1	∞
3	4	∞	0	∞
4	∞	2	9	0

D_1:

	1	2	3	4
1	0	8	∞	1
2	∞	0	1	∞
3	4	12	0	5
4	∞	2	9	0

$\infty - [1] - \infty$

D_1:

$3 - 1 - 2 = 12$

$3 - 1 - 4 = 5$

D_2:

	1	2	3	4
1	0	8	9	1
2	∞	0	1	∞
3	4	12	0	5
4	∞	2	3	0

D_2

$\infty - [2] - \infty$

$\infty - [1,2] - \infty$

$\infty - [2,1] - \infty$

$4 - 2 - 3 = 3$

$1 - 2 - 3 = 9$

D_3:

	1	2	3	4
1	0	8	9	1
2	5	0	1	6
3	4	12	0	5
4	7	2	3	0

D_3

$2 - 3 - 1 = 5$

$2 - 3 - 1 - 4 = 6$

$4 - 2 - 3 - 1 = 7$

$4 - 3 - 1 = 13$ ×

D_4:

	1	2	3	4
1	0	3	4	1
2	5	0	1	6
3	4	7	0	5
4	7	2	3	0

D_4

$1 - 4 - 3 = 10$ ×

$1 - 4 - 2 = 3$

$3 - 1 - 4 - 2 = 7$

$1 - 4 - 2 - 3 = 4$

Shortest length (a to b)

$3 - 4 = 5$