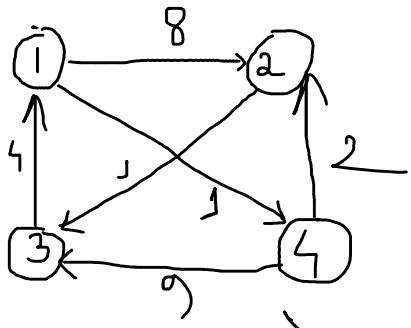
Floyd warshall algo S section

07 April 2025 09:07

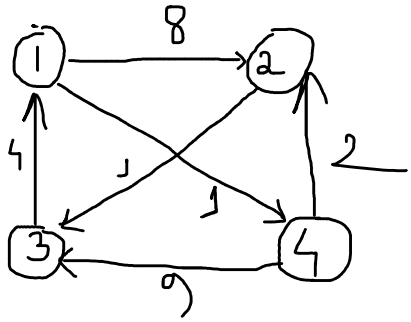


Src	Destination
1	2, 3, 4
2	1, 3, 4
3	1, 2, 4
4	1, 2, 3.

→ Matrix → N×N

↓

No. of matrices = N + 1.



$D_0 =$

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

$D_0 =$

	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

2 to 3 via 1 = 2 to 1 + 1 to 3 = ∞ | 2 to 4 = 2 to 1 + 1 to 4 = ∞

3 to 2 = 3 to 1 + 1 to 2 = 4 + 8 = 12 | 3 to 4 = 3 to 1 + 1 to 4 = 4 + 1 = 5

4 to 2 = 4 to 1 + 1 to 2 = ∞ | 4 to 3 = 4 to 1 + 1 to 3 = ∞

$D_1 =$

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

$D_2 =$

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

$$\begin{matrix} \\ 4 \end{matrix}\begin{bmatrix} \infty & 2 & 9 & 0 \end{bmatrix} \qquad \begin{matrix} \\ 4 \end{matrix}\begin{bmatrix} \infty & 2 & 3 & 0 \end{bmatrix}$$

1 to 3 via 2 = 1 to 2 + 2 to 3 = 8 + 1 = 9. | 1 to 4 = 1 to 2 + 2 to 4 = 8 + ∞ = ∞

3 to 1 = 3 to 2 + 2 to 1 = 12 + ∞ = ∞ | 3 to 4 = 3 to 2 + 2 to 4 = 12 + ∞ = ∞

4 to 1 = 4 to 2 + 2 to 1 = 2 + ∞ = ∞ | 4 to 3 = 4 to 2 + 2 to 3 = 2 + 1 = 3.

$D_2 =$

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

$D_3 =$

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

1 to 2 via 3 = 1 to 3 + 3 to 2 = 9 + 12 = 21 | 2 to 1 = 2 to 3 + 3 to 1 = 1 + 4 = 5

1 to 4 = 1 to 3 + 3 to 4 = 9 + 5 = 14 | 2 to 4 = 2 to 3 + 3 to 4 = 1 + 5 = 6.

4 to 1 = 4 to 3 + 3 to 1 = 3 + 4 = 7. | 4 to 2 = 4 to 3 + 3 to 2 = 3 + 12 = 15

$D_3 =$

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

$D_4 =$

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

1 to 2 via 4 = 1 to 4 + 4 to 2 = 1 + 2 = 3 | 1 to 3 = 1 to 4 + 4 to 3 = 1 + 3 = 4

2 to 1 = 2 to 4 + 4 to 1 = 6 + 7 = 13 | 2 to 3 = 2 to 4 + 4 to 3 = 6 + 3 = 9

3 to 1 = 3 to 4 + 4 to 1 = 5 + 7 = 12 | 3 to 2 = 3 to 4 + 4 to 2 = 5 + 2 = 7.