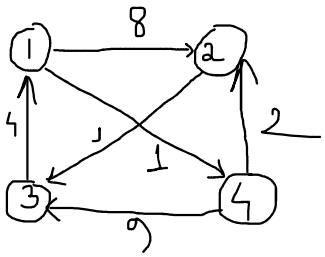
# Floyd warshall abaiaj section

01 April 2025 22:04




| Src | Dest |
|---|---|
| 1 | 2, 3, 4 |
| 2 | 1, 3, 4 |
| 3 | 1, 2, 4 |
| 4. | 1, 2, 3 |

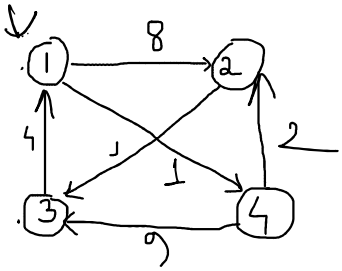
⇓

Matrix use

⇓

N+1 matrix = 4+1 = 5.

Dimension → N×N.




$D_0 =$

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

2, 3

$D_0 =$

| | 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 |

D(2 to 3 via 1) = D(2 to 1) + D(1 to 3)

= ∞.

$D(2 \text{ to } 4 \text{ via } 1) = D(2 \text{ to } 1) + D(1 \text{ to } 4)$

$4-2 = 4-1+1-2$

$= \infty$

$3-2 = 3-1+1-2$

$= 4+8 = 12.$

$4-3 = 4-1+1-3 = \infty$

$3-4 = 3-1+1-4$

$= 4+1 = 5$

$D_1 =$

| | 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 |

$1-3 = 1-2+2-3$

$= 8+1$

$= 9.$

$1-4 = 1-2+2-4$

$= 8+\infty$

$$\begin{array}{c|cccc} 3 & 4 & 12 & 0 & 5 \\ 4 & \infty & 2 & 3 & 0 \end{array}$$

$3-4 = 3-2+2-4$
$= 12 + \infty = \infty$

$4-1 = 4-2+2-1$
$= 2+\infty$
$= \infty$

$4-3 = 4-2+2-3$
$= 2+1$
$= 3$

$1-4 = 1-2+2-4$
$= 8+\infty$

$3-1 = 3-2+2-1$
$= 12+\infty$
$= \infty$.

$D_2 =$

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1 | 0 | 8 | 9 | 1 |
| 2 | $\infty$ | 0 | 1 | $\infty$ |
| 3 | 4 | 12 | 0 | 5 |
| 4 | $\infty$ | 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 |

$1-2 = 1-3+3-2 = 9+12 = 21.$ $\quad 1-4 = 1-3+3-4 = 9+5 = 14.$

$2-1 = 2-3+3-1 = 1+4 = 5$ $\quad 2-4 = 2-3+3-4 = 1+5 = 6.$

$4-1 = 4-3+3-1 = 3+4 = 7$ $\quad 4-2 = 4-3+3-2 = 3+12 = 15.$

$D_3 =$

| | 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 |

$1-2 = 1-4+4-2 = 1+2 = 3.$

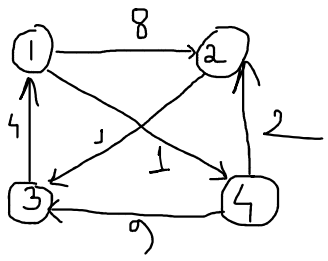
$2-1 = 2-4+4-1 = 6+7 = 13.$

$3-1 = 3-4+4-1 = 5+7 = 12$

$1-3 = 1-4+4-3 = 1+3 = 4$

$2-3 = 2-4+4-3 = 6+3 = 9$

$3-2 = 3-4+4-2 = 5+2 = 7.$




$D_4 =$

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