

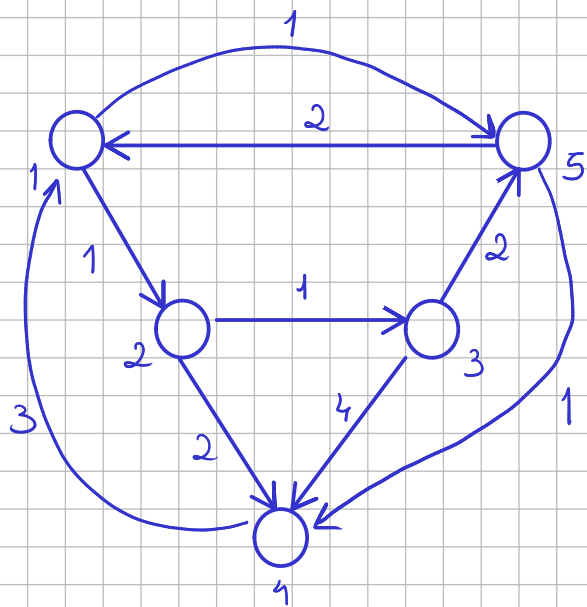
It.	$v[0]$	$v[1]$	$v[2]$	$v[3]$
1	0	∞	∞	∞
2	0	5	4	8
3	0	-2	4	1
		-3	3	0
		-3	3	0
		-4	2	

$v[0] = 0$
 $v[1] = -4$
 $v[2] = 2$
 $v[3] = 0$

$$0 > 3 + (-4)$$

$$0 > -1$$

TRUE



$$M^0 = \begin{bmatrix} 0 & 1 & \infty & \infty & 1 \\ \infty & 0 & 1 & 2 & \infty \\ \infty & \infty & 0 & 4 & 2 \\ 3 & \infty & \infty & 0 & \infty \\ 2 & \infty & \infty & 1 & 0 \end{bmatrix}$$

$$\pi^0 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 3 & 4 & 5 \\ 2 & 1 & \text{Null} & 3 & 5 \\ 3 & 1 & 2 & \text{Null} & 5 \\ 4 & 1 & 2 & 3 & \text{Null} \\ 5 & 1 & 2 & 3 & 4 & \text{Null} \end{bmatrix}$$

$$M^1 = \begin{bmatrix} 0 & 1 & \infty & \infty & 1 \\ \infty & 0 & 1 & 2 & \infty \\ \infty & \infty & 0 & 4 & 2 \\ 3 & 4 & \infty & 0 & 4 \\ 2 & 3 & \infty & 1 & 0 \end{bmatrix}$$

$$\pi^1 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 3 & 4 & 5 \\ 2 & 1 & \text{Null} & 3 & 5 \\ 3 & 1 & 2 & \text{Null} & 5 \\ 4 & 1 & 1 & 3 & \text{Null} \\ 5 & 1 & 1 & 3 & 4 & \text{Null} \end{bmatrix}$$

$$M^2 = \begin{bmatrix} 0 & 1 & 2 & 3 & 1 \\ \infty & 0 & 1 & 2 & \infty \\ \infty & \infty & 0 & 4 & 2 \\ 3 & 4 & 5 & 0 & 4 \\ 2 & 3 & 4 & 1 & 0 \end{bmatrix}$$

$$\pi^2 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 2 & 2 & 5 \\ 2 & 1 & \text{Null} & 3 & 5 \\ 3 & 1 & 2 & \text{Null} & 5 \\ 4 & 1 & 1 & 2 & \text{Null} \\ 5 & 1 & 1 & 2 & 2 & \text{Null} \end{bmatrix}$$

$$M^3 = \begin{bmatrix} 0 & 1 & 2 & 3 & 1 \\ \infty & 0 & 1 & 2 & 3 \\ \infty & \infty & 0 & 4 & 2 \\ 3 & 4 & 5 & 0 & 4 \\ 2 & 3 & 4 & 1 & 0 \end{bmatrix}$$

$$\pi^3 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 2 & 2 & 5 \\ 2 & 1 & \text{Null} & 3 & 3 \\ 3 & 1 & 2 & \text{Null} & 5 \\ 4 & 1 & 1 & 2 & \text{Null} \\ 5 & 1 & 1 & 2 & 2 & \text{Null} \end{bmatrix}$$

$$M^4 = \begin{bmatrix} 0 & 1 & 2 & 3 & 1 \\ 5 & 0 & 1 & 2 & 3 \\ 7 & 6 & 0 & 4 & 2 \\ 3 & 4 & 5 & 0 & 4 \\ 2 & 3 & 4 & 1 & 0 \end{bmatrix}$$

$$\pi^4 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 2 & 2 & 5 \\ 2 & 4 & \text{Null} & 3 & 3 \\ 3 & 4 & 4 & \text{Null} & 5 \\ 4 & 1 & 1 & 2 & \text{Null} \\ 5 & 1 & 1 & 2 & 2 & \text{Null} \end{bmatrix}$$

matriz de distância:

```
[[0 1 2 2 1]
 [5 0 1 2 3]
 [4 5 0 3 2]
 [3 4 5 0 4]
 [2 3 4 1 0]]
```

matriz de antecessores:

```
[[None 1 2 5 1]
 [4 None 2 2 3]
 [5 1 None 5 3]
 [4 1 2 None 1]
 [5 1 2 5 None]]
```

$$M^5 = \begin{bmatrix} 0 & 1 & 2 & 3 & 1 \\ 5 & 0 & 1 & 2 & 3 \\ 4 & 5 & 0 & 3 & 2 \\ 3 & 4 & 5 & 0 & 4 \\ 2 & 3 & 4 & 1 & 0 \end{bmatrix}$$

$$\pi^5 = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ \text{Null} & 2 & 2 & 2 & 5 \\ 2 & 4 & \text{Null} & 3 & 3 \\ 3 & 5 & 5 & \text{Null} & 5 \\ 4 & 1 & 1 & 2 & \text{Null} \\ 5 & 1 & 1 & 2 & 2 & \text{Null} \end{bmatrix}$$