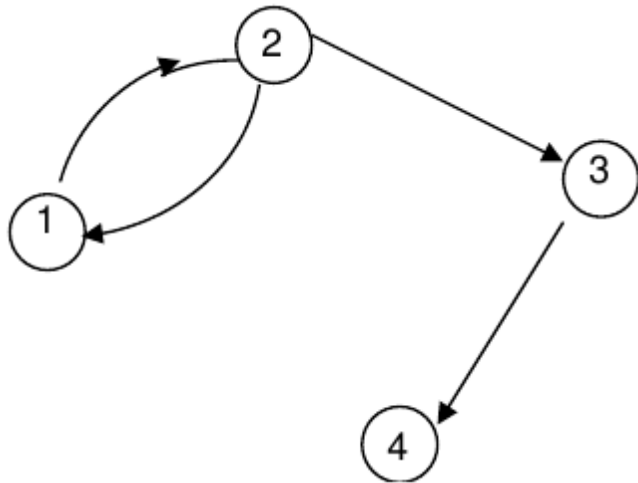




Warshall

Matriz de Conexidad

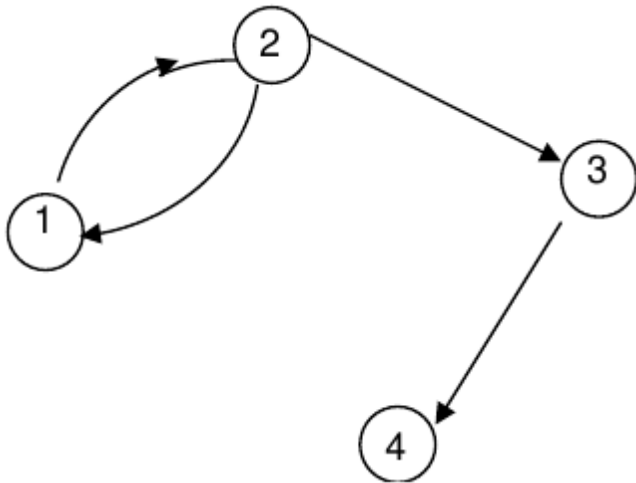
Matriz de conexidad



$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

Matriz de conexidad



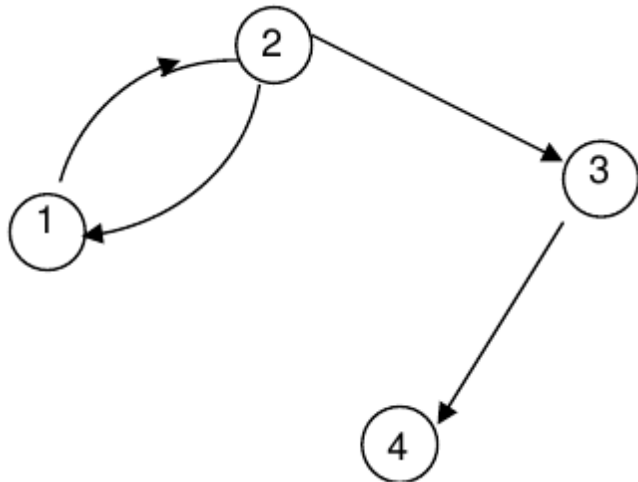
W1

0	1	0	0
1			
0			
0			

$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

Matriz de conexidad



W1

0	1	0	0
1	1		
0			
0			

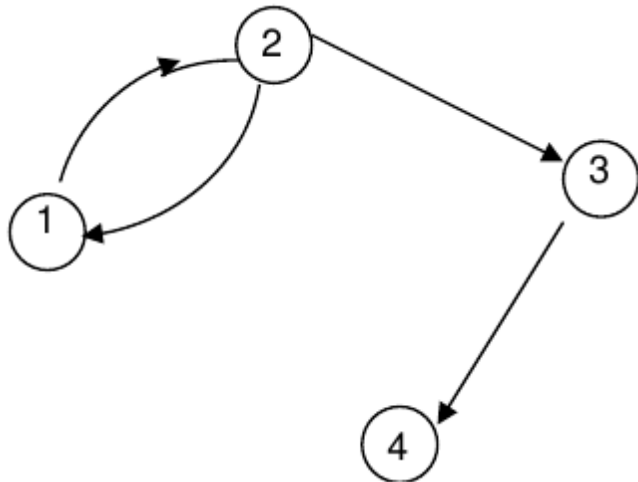
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$1 * 1 = 1$$

$$\text{Max}(1, 0) = 1$$

Matriz de conexidad



W1

0	1	0	0
1	1	1	
0			
0			

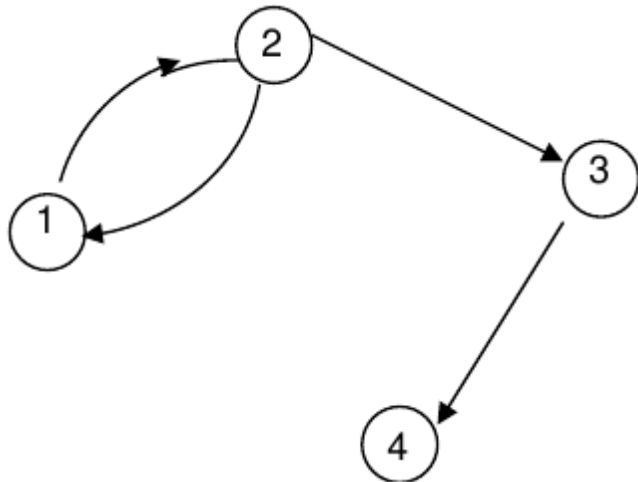
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$1 * 0 = 0$$

$$\text{Max}(0, 1) = 1$$

Matriz de conexidad



W1

0	1	0	0
1	1	1	0
0			
0			

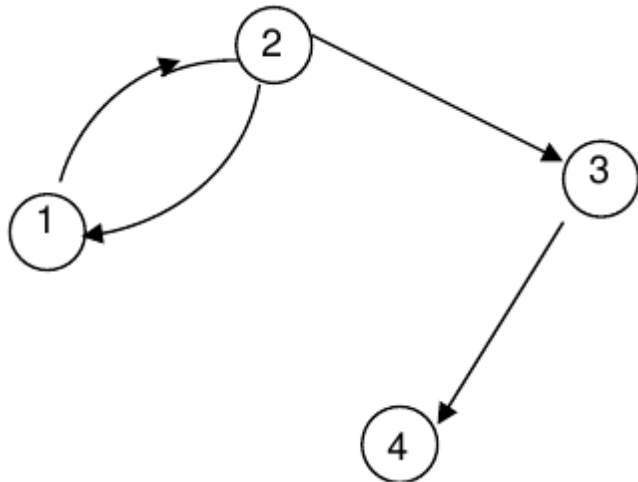
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$1 * 0 = 0$$

$$\text{Max}(0, 0) = 0$$

Matriz de conexidad



W1

0	1	0	0
1	1	1	0
0	0		
0			

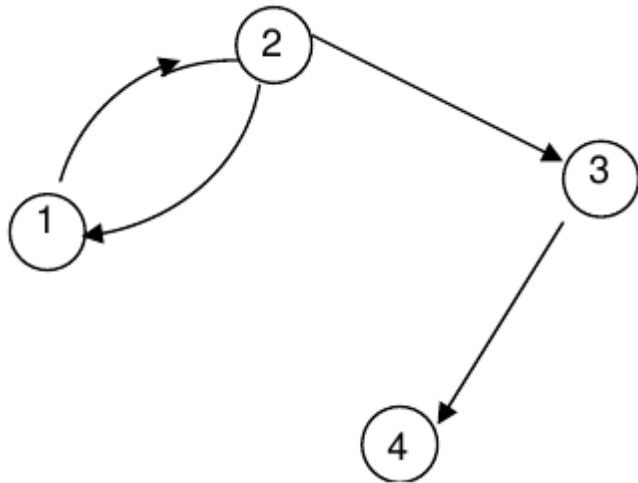
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$0 * 1 = 0$$

$$\text{Max}(0, 0) = 0$$

Matriz de conexidad



W1

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

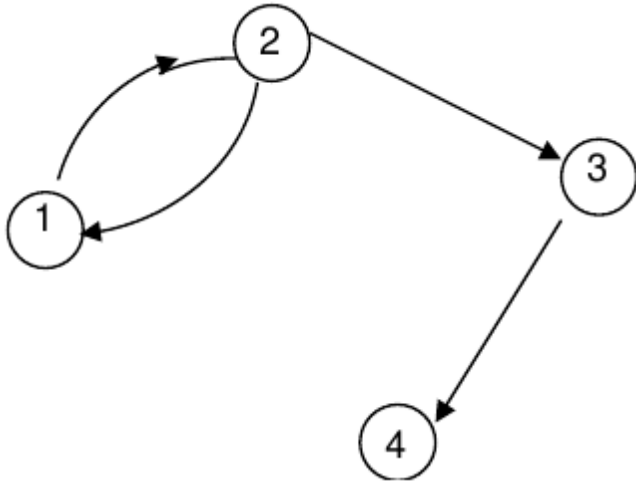
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$0 * 0 = 0$$

$$\text{Max}(0, 0) = 0$$

Matriz de conexidad



W1

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

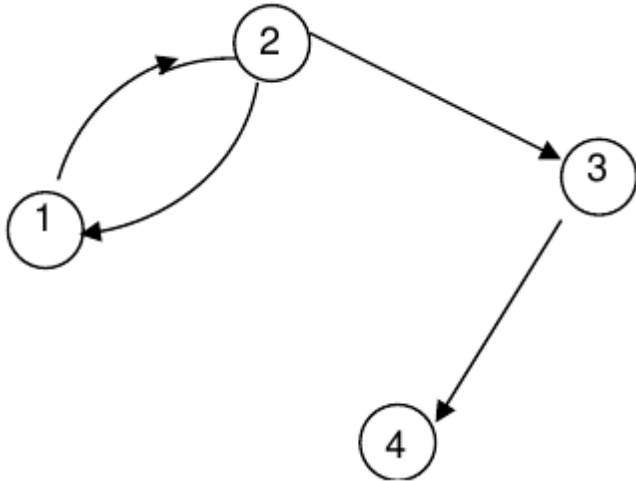
$$M_R = W^0$$

$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$0 * 0 = 0$$

$$\text{Max}(0, 1) = 1$$

Matriz de conexidad



W1

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

$$M_R = W^0$$

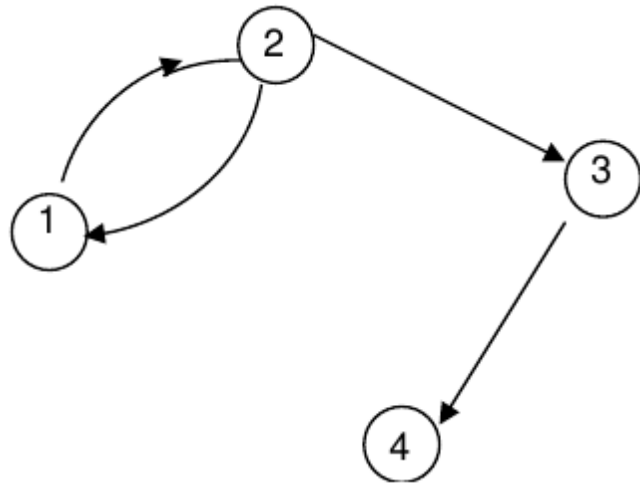
$$\begin{pmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$$0 * 1 = 0 \rightarrow \text{Max}(0,0) = 0$$

$$0 * 0 = 0 \rightarrow \text{Max}(0,0) = 0$$

$$0 * 0 = 0 \rightarrow \text{Max}(0,0) = 0$$

Matriz de conexidad



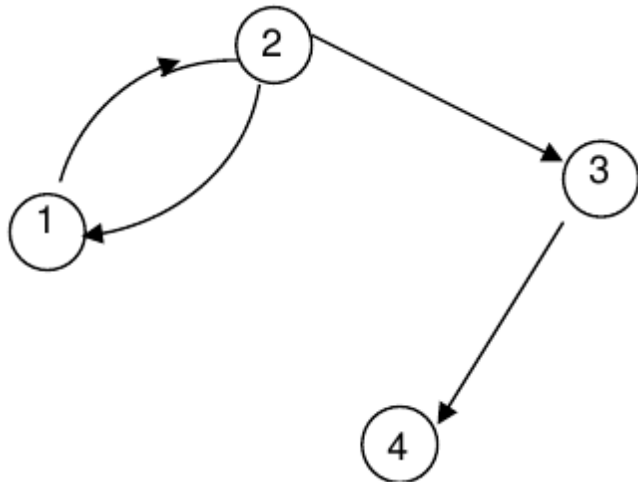
W1

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

W2

	1		
1	1	1	0
	0		
	0		

Matriz de conexidad



W1

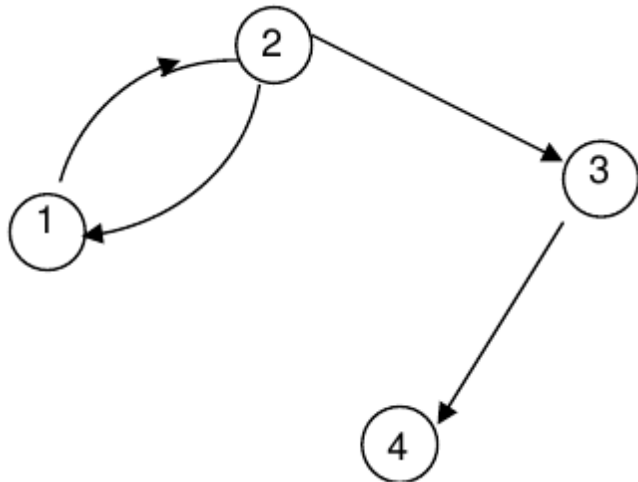
0	1	0	0
1	1	1	0
0	0	0	1
0	0	0	0

W2

1	1		
1	1	1	0
	0		
	0		

$$1 * 1 = 1 \rightarrow \text{Max}(1, 0) = 1$$

Matriz de conexidad



W1

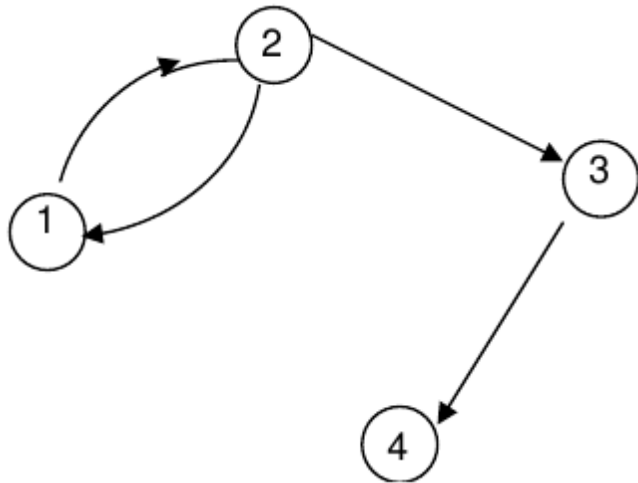
0	1	0	0
1	1	1	0
0	0	0	1
0	0	0	0

W2

1	1	1	
1	1	1	0
	0		
	0		

$$1 * 1 = 1 \rightarrow \text{Max}(1, 0) = 1$$

Matriz de conexidad



W1

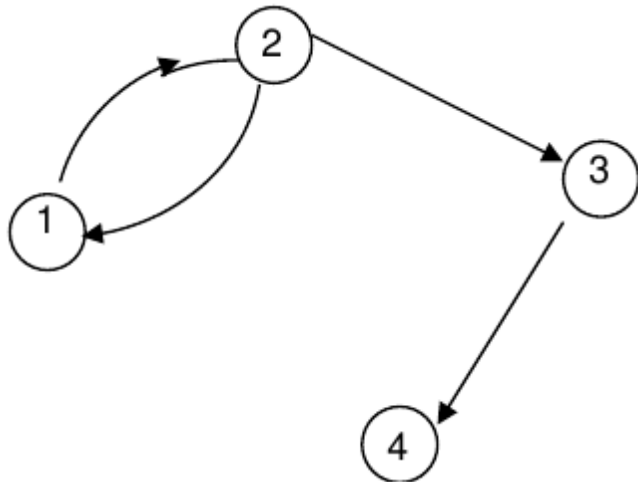
0	1	0	0
1	1	1	0
0	0	0	1
0	0	0	0

W2

1	1	1	0
1	1	1	0
	0		
	0		

$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

Matriz de conexidad



W2

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

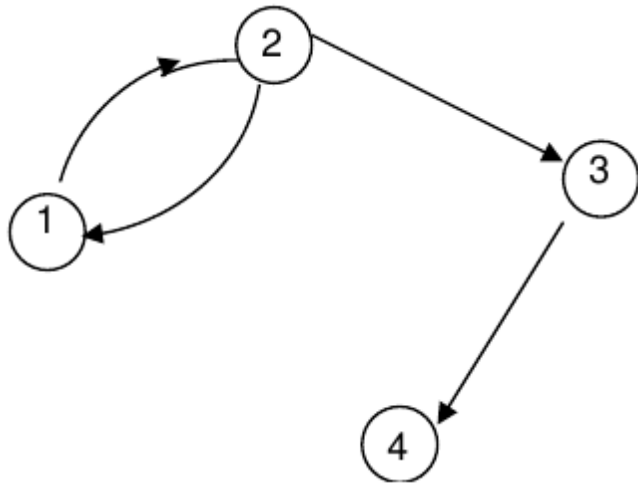
W1

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

$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

Matriz de conexidad



W2

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

W1

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

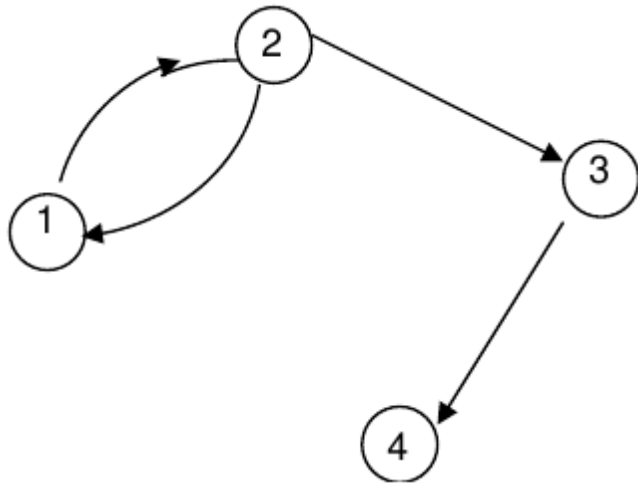
$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

$$0 * 0 = 0 \rightarrow \text{Max}(0, 1) = 1$$

$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

$$0 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

Matriz de conexidad



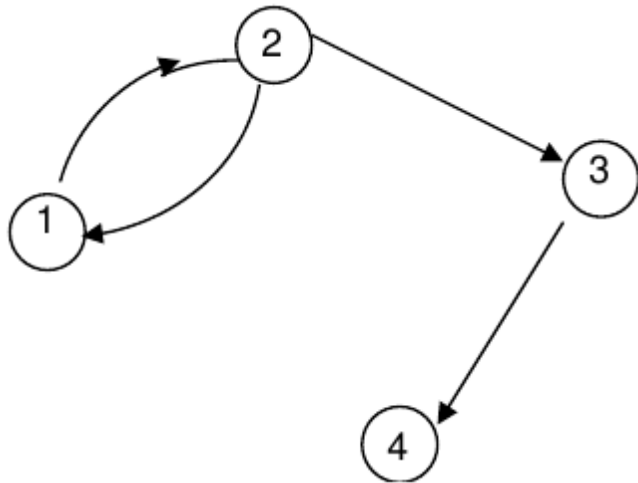
W2

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

W3

		1	
		1	
0	0	0	1
		0	

Matriz de conexidad



W3

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

W2

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

$$0 * 1 = 0 \rightarrow \text{Max}(0, 1) = 1$$

$$0 * 1 = 0 \rightarrow \text{Max}(0, 1) = 1$$

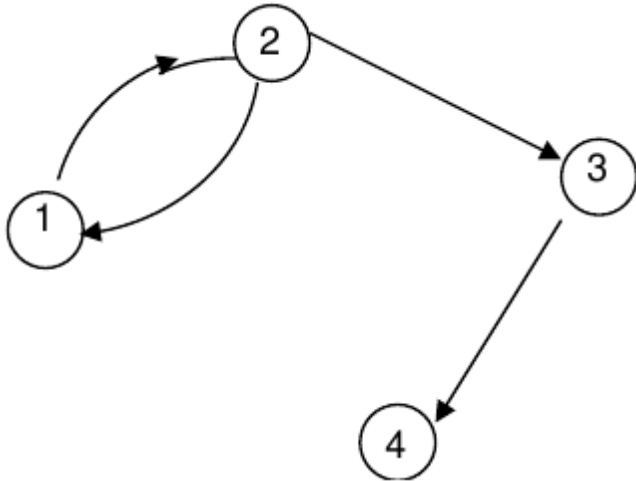
$$0 * 1 = 0 \rightarrow \text{Max}(0, 1) = 1$$

$$0 * 1 = 0 \rightarrow \text{Max}(0, 1) = 1$$

$$0 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

$$0 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

Matriz de conexidad



W3

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

W2

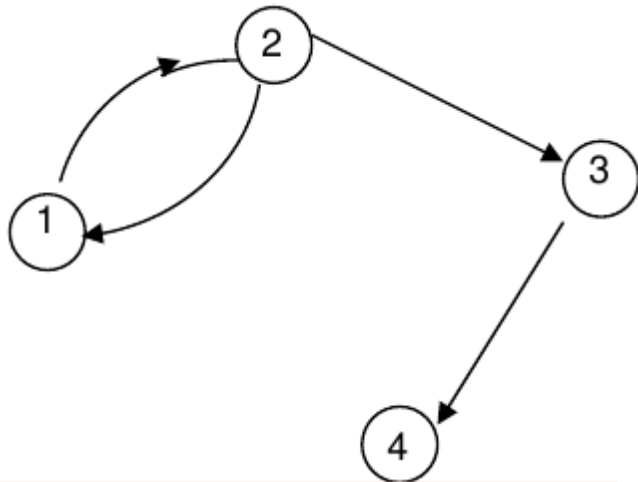
1	1	1	0
1	1	1	0
0	0	0	1
0	0	0	0

$$1 * 1 = 1 \rightarrow \text{Max}(1, 0) = 1$$

$$1 * 1 = 1 \rightarrow \text{Max}(1, 0) = 0$$

$$1 * 0 = 0 \rightarrow \text{Max}(0, 0) = 0$$

Matriz de conexidad



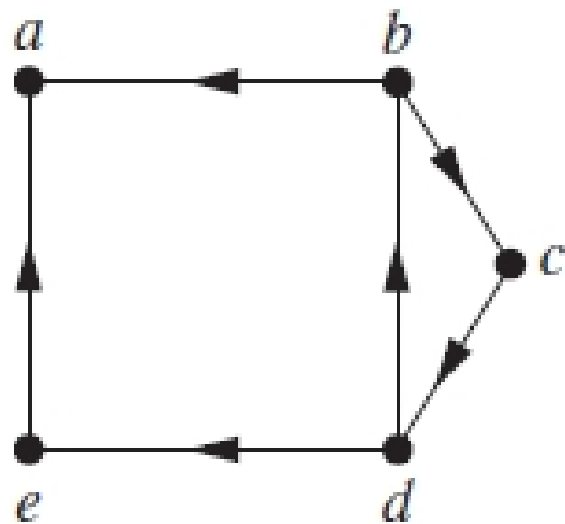
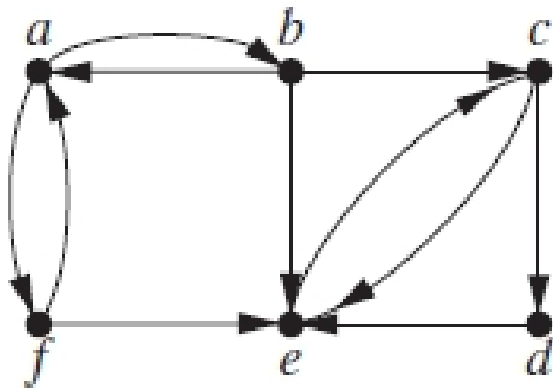
W3

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

W3 = W4 = Wfinal

W4

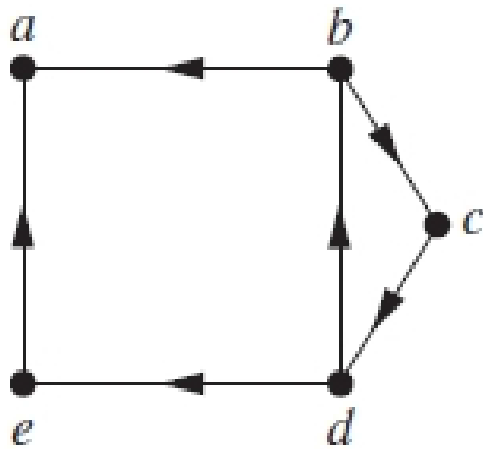
1	1	1	1
1	1	1	1
0	0	0	1
0	0	0	0



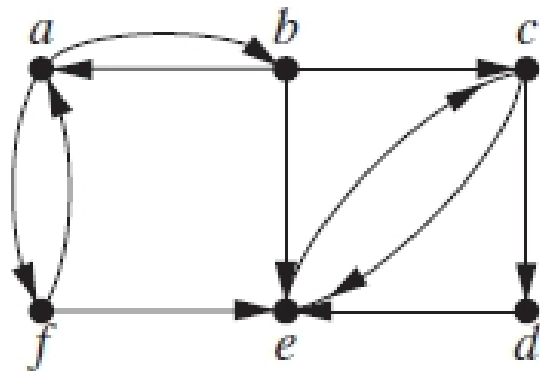
Ejercicio

- Hallar la matriz de conexidad usando el algoritmo de Warshall de los siguientes grafos

Ejercicio



	a	b	c	d	e
a	0	0	0	0	0
b	1	1	1	1	1
c	1	1	1	1	1
d	1	1	1	1	1
e	1	0	0	0	0



	a	b	c	d	e	f
a	1	1	1	1	1	1
b	1	1	1	1	1	1
c	0	0	1	1	1	0
d	0	0	1	1	1	0
e	0	0	1	1	1	0
f	1	1	1	1	1	1