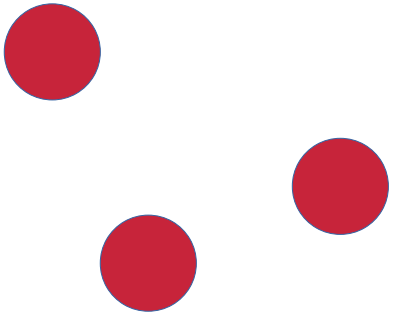
Modélisation des Réseaux et Web

Ensemble 1

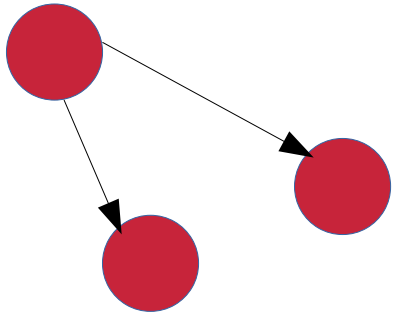
Ale Abdo (LISIS-UGE)

Éléments

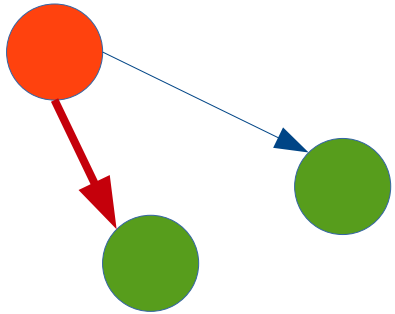
Noeuds



Liens

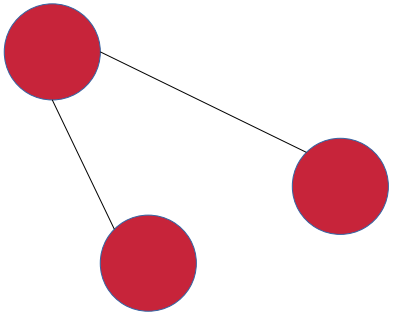


Étiquettes

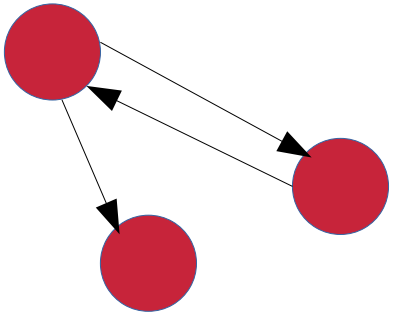


Variantes

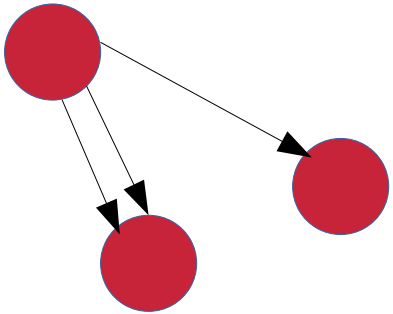
Non Orienté



Orienté

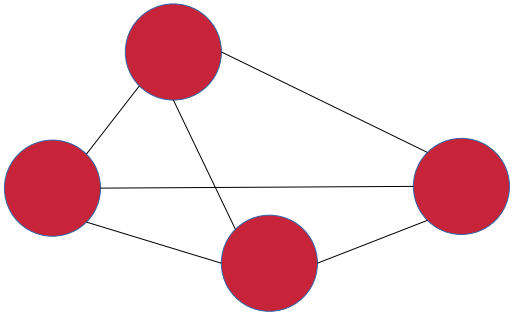


Multigraphe

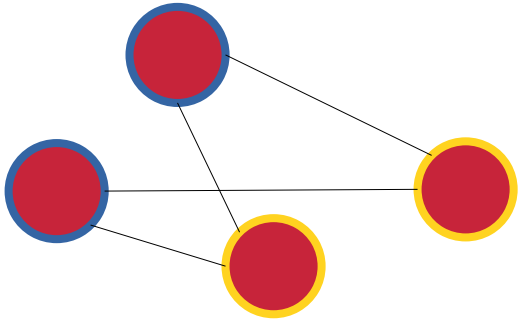


Cas notables

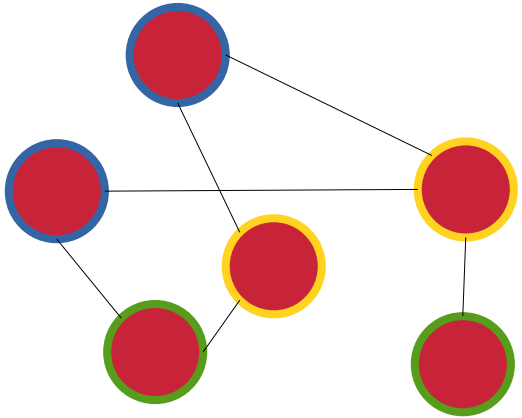
Complet



Biparti

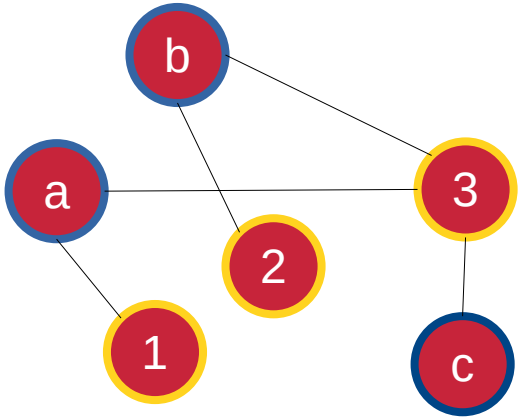


N-parti

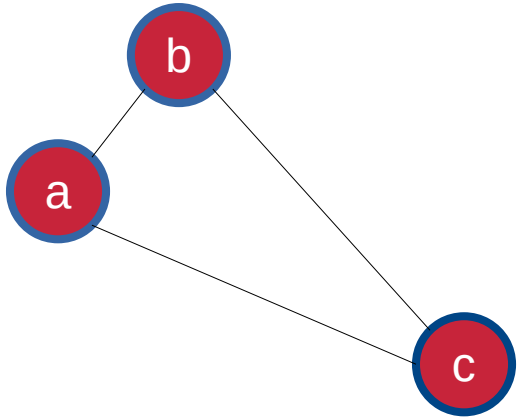


Cas notables

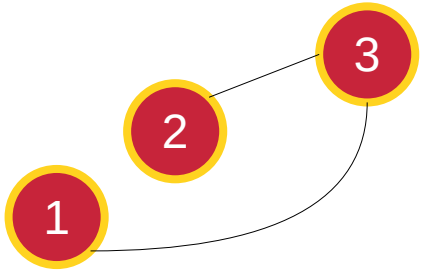
Biparti



Projection sur {a,b,c}

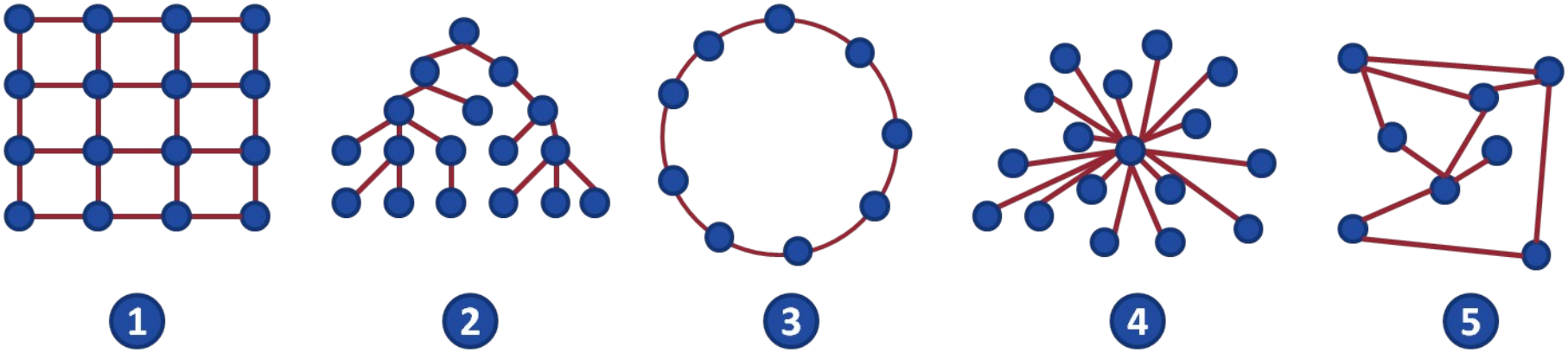


Projection sur {1,2,3}



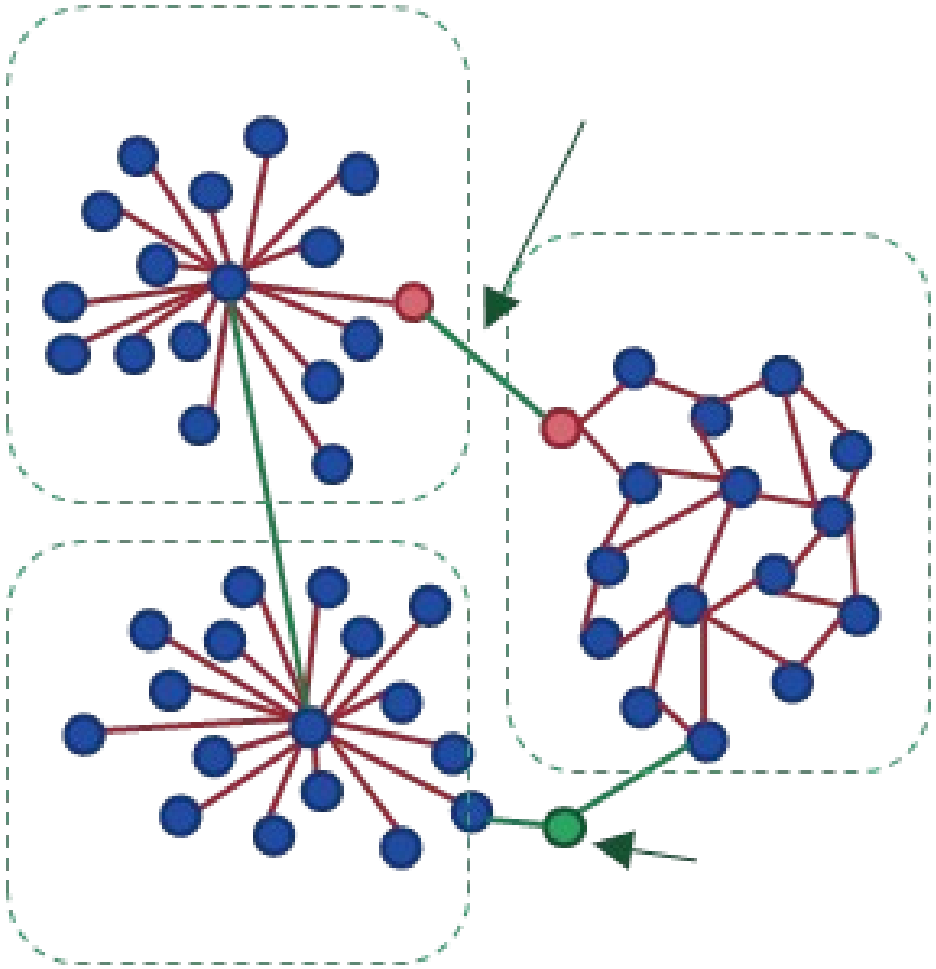
Cas notables

1) Régulier
2) Arbre
3) Cycle
4) Étoile
5) « Complexe »

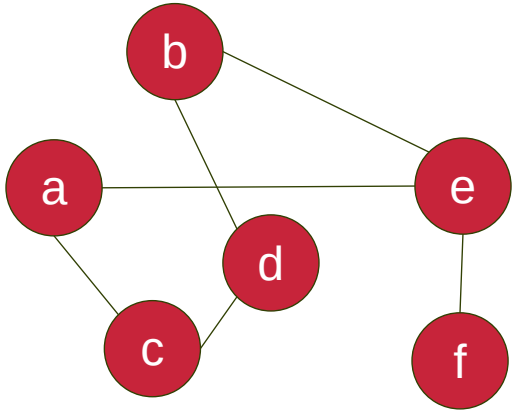


Cas notables

Sous-graphes



Voisins et degrés



d(a) =

d(b) =

d(c) =

d(e) =

d(f) =

N(a) =

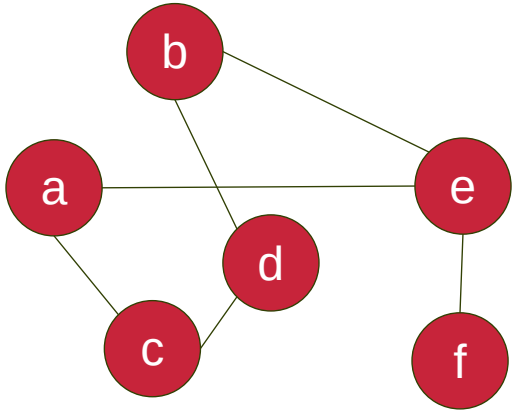
N(b) =

N(c) =

N(e) =

N(f) =

Voisins et degrés



d(a) = 2

d(b) = 2

d(c) = 2

d(e) = 3

d(f) = 1

N(a) = {c, e}

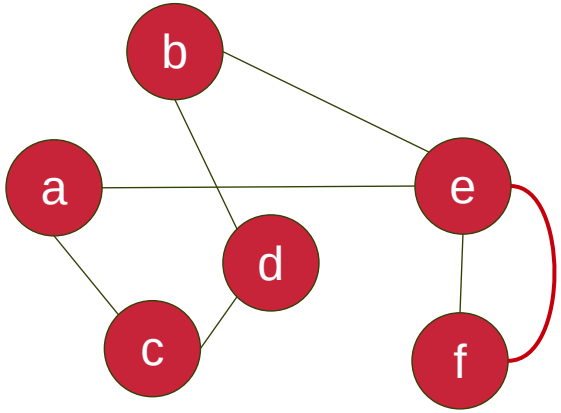
N(b) = {d, e}

N(c) = {a, d}

N(e) = {a, b, f}

N(f) = {e}

Voisins et degrés



d(a) = 2

d(b) = 2

d(c) = 2

d(e) = 4

d(f) = 2

N(a) = {c, e}

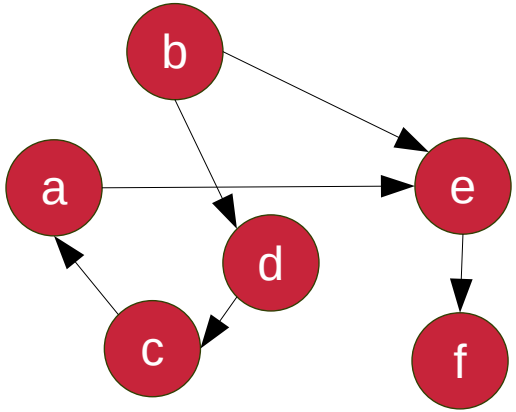
N(b) = {d, e}

N(c) = {a, d}

N(e) = {a, b, f} # = 3

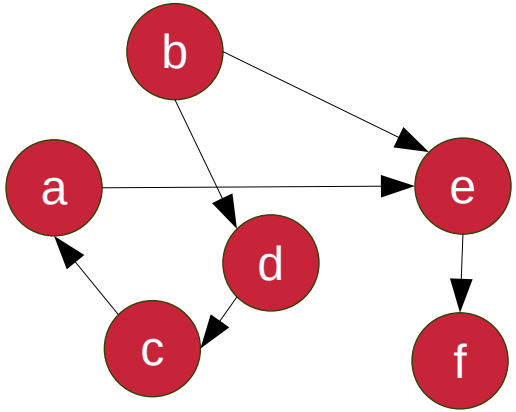
N(f) = {e} # = 1

Voisins et degrés



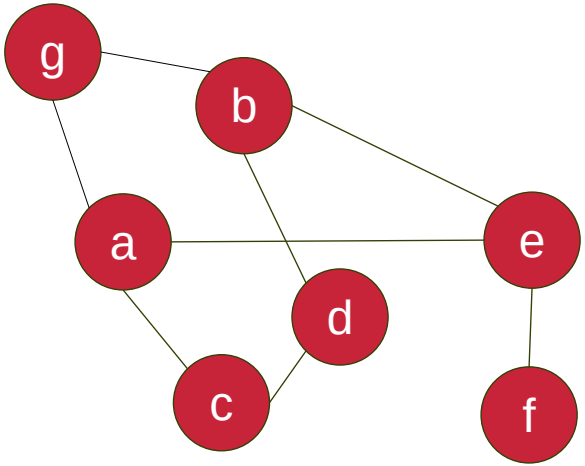
$d^-(a)$ =	$d^+(a)$ =	$N^-(a)$ =	$N^+(a)$ =
$d^-(b)$ =	$d^+(b)$ =	$N^-(b)$ =	$N^+(b)$ =
$d^-(c)$ =	$d^+(c)$ =	$N^-(c)$ =	$N^+(c)$ =
$d^-(e)$ =	$d^+(e)$ =	$N^-(e)$ =	$N^+(e)$ =
$d^-(f)$ =	$d^+(f)$ =	$N^-(f)$ =	$N^+(f)$ =

Voisins et degrés



$d^-(a) = 1$	$d^+(a) = 1$	$N^-(a) = \{c\}$	$N^+(a) = \{e\}$
$d^-(b) = 0$	$d^+(b) = 2$	$N^-(b) = \{\}$	$N^+(b) = \{d, e\}$
$d^-(c) = 1$	$d^+(c) = 1$	$N^-(c) = \{d\}$	$N^+(c) = \{a\}$
$d^-(e) = 2$	$d^+(e) = 1$	$N^-(e) = \{a, b\}$	$N^+(e) = \{f\}$
$d^-(f) = 1$	$d^+(f) = 0$	$N^-(f) = \{e\}$	$N^+(f) = \{\}$

Chemin et distance



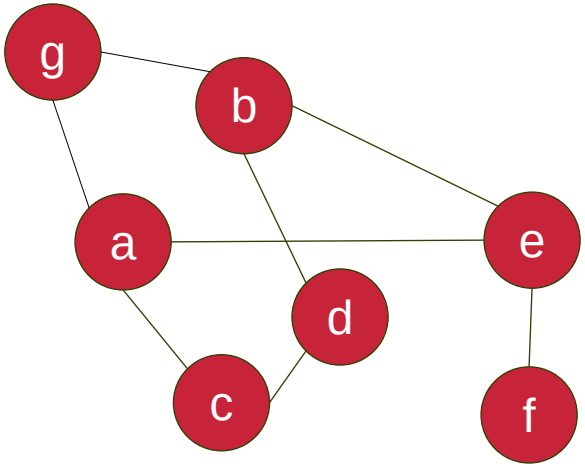
C(a,b) =

C(e,f) =

C(f,g) =

C(e,e) =

Chemin et distance



Chemin élémentaire (nœuds uniques)

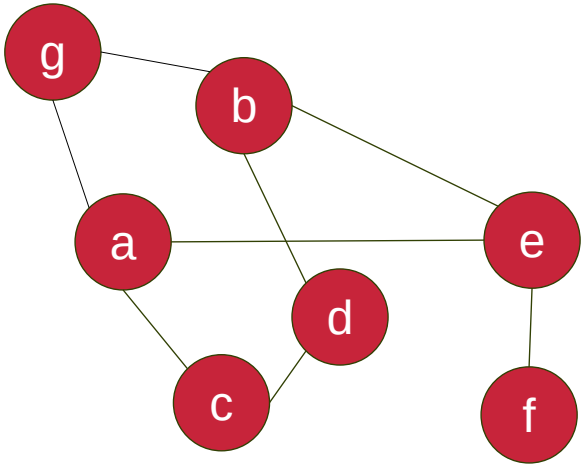
C(a,b) = (a,c,d,b), (a,g,b), (a,e,b)

C(e,f) = (e,f)

C(f,g) = (f,e,b,g), (f,e,a,g), (f,e,a,c,d,b,g),
(f,e,b,d,c,a,g)

C(e,e) = {(e)} / (e,b,g,a,e), (e,a,g,b,e), (e,b,d,c,a,e),
(e,a,c,d,b,e), (e,f,e)

Chemin et distance



Chemin simple (liens uniques)

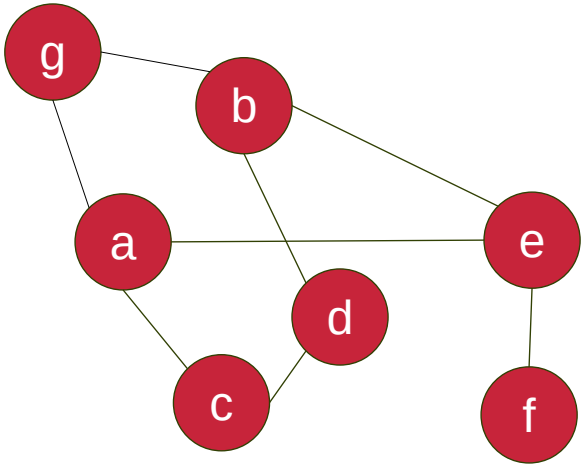
C(a,b) = (a,c,d,b), (a,g,b), (a,e,b), (a,c,d,b,g,a,e,b), ...

C(e,f) = (e,f), (e,b,g,a,e,f), ...

C(f,g) = (f,e,b,g), (f,e,a,g), (f,e,a,c,d,b,g),
(f,e,b,d,c,a,g)

C(e,e) = {(e)} / (e,b,g,a,e), (e,a,g,b,e), (e,b,d,c,a,e),
(e,a,c,d,b,e), ~~(e,f,e)~~

Chemin et distance



Distance (longueur du chemin plus court)

C(a,b) =

d(a,b) =

C(e,f) =

d(e,f) =

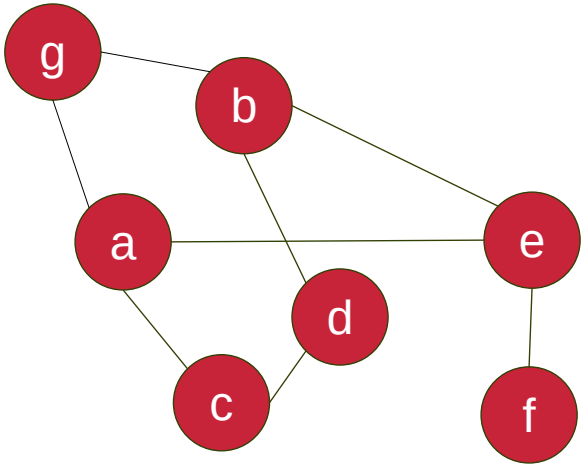
C(f,g) =

d(f,g) =

C(e,e) =

d(e,e) =

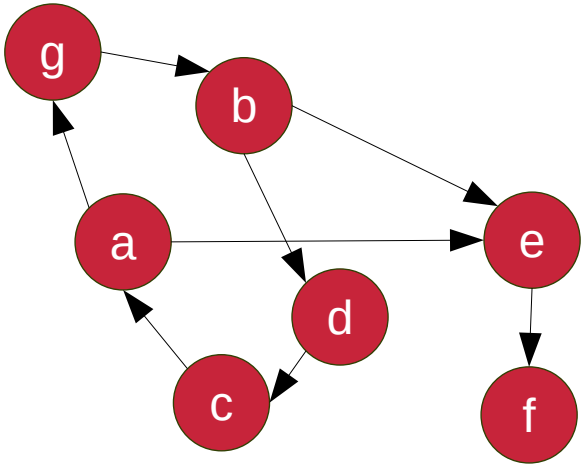
Chemin et distance



Distance (longueur du chemin plus court)

C(a,b) = (a,g,b), (a,e,b)	d(a,b) = 2
C(e,f) = (e,f)	d(e,f) = 1
C(f,g) = (f,e,a,g), (f,e,b,g)	d(f,g) = 3
C(e,e) = {(e)}	d(e,e) = 0

Chemin et distance



Distance (longueur du chemin plus court)

C(a,b) =

d(a,b) =

C(e,f) =

d(e,f) =

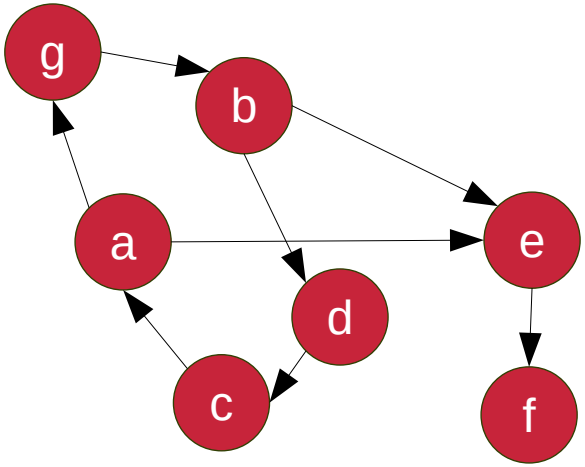
C(f,g) =

d(f,g) =

C(e,e) =

d(e,e) =

Chemin et distance

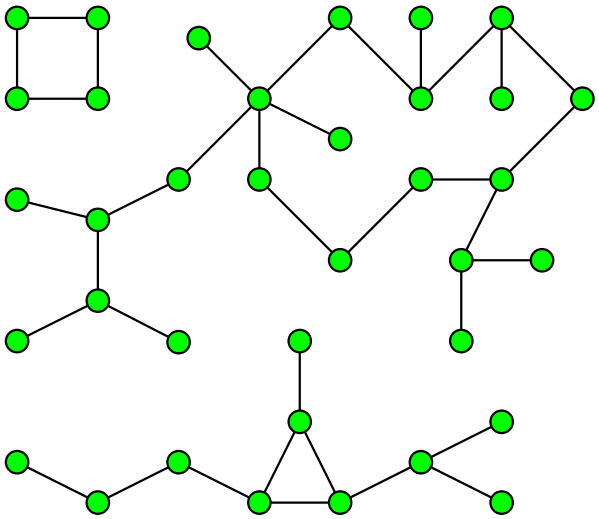


Distance (longueur du chemin plus court)

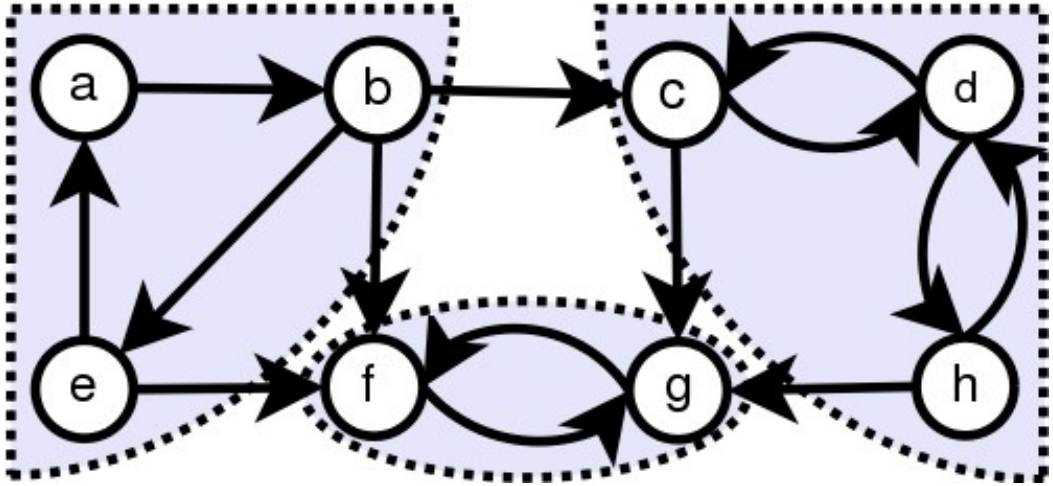
C(a,b) = (a,g,b)	d(a,b) = 2
C(e,f) = (e,f)	d(e,f) = 1
C(f,g) = {}	d(f,g) = ?
C(e,e) = {(e)}	d(e,e) = 0

Chemin et distance

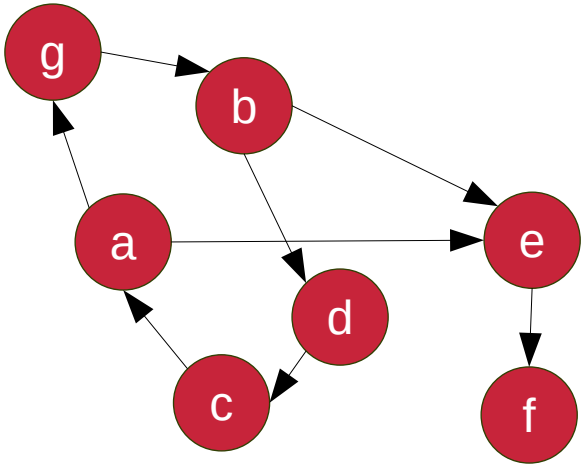
Composante connexe



Composante fortement connexe

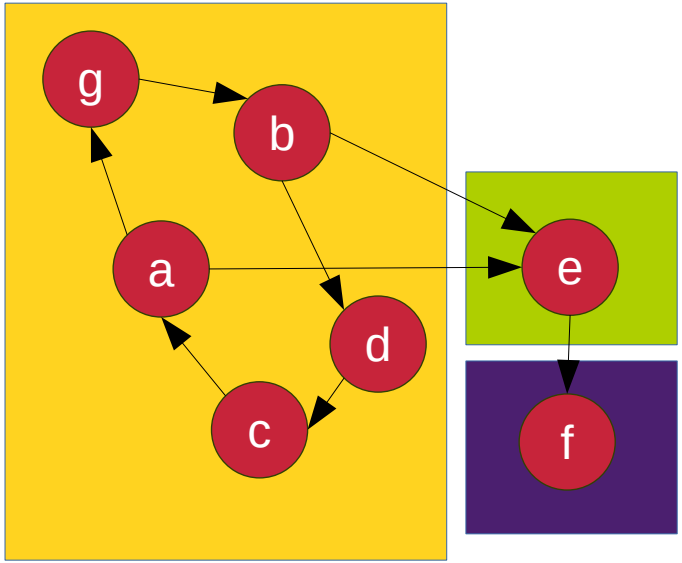


Chemin et distance



Composantes fortement connexes

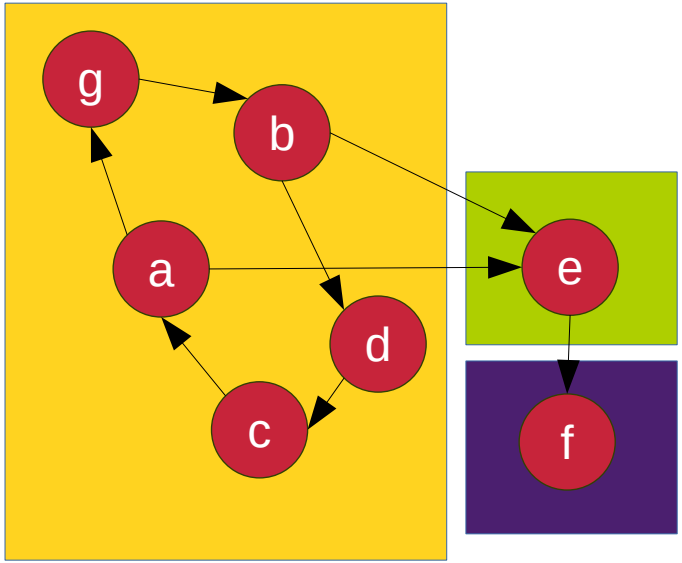
Chemin et distance



Composantes fortement connexes

- {a, b, c, d, g}
- {e}
- {f}

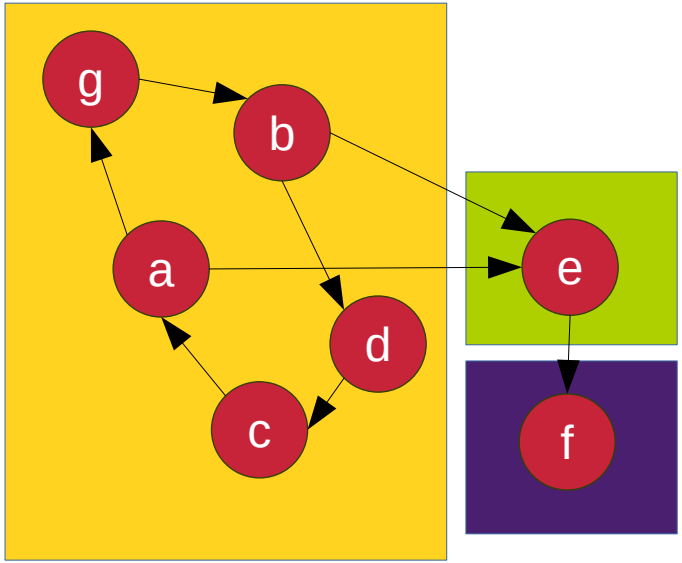
Chemin et distance



Diamètre (la plus grande distance)

- Δ{a, b, c, d, g} =
- Δ{e} =
- Δ{f} =

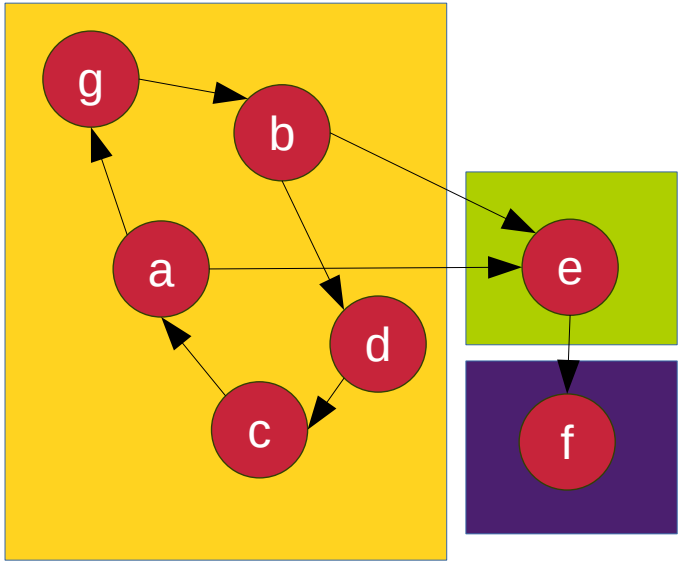
Chemin et distance



Diamètre (la plus grande distance)

d(,)	a	b	c	d	g
a					
b					
c					
d					
g					

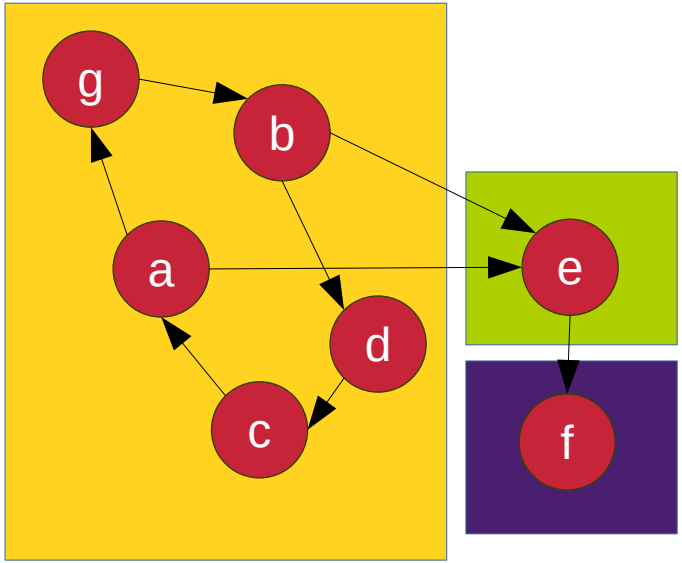
Chemin et distance



Diamètre (la plus grande distance)

d(,)	a	b	c	d	g
a	0	2	4	3	1
b	3	0	2	1	4
c	1	3	0	4	2
d	2	4	1	0	3
g	4	1	3	2	0

Chemin et distance



Diamètre (la plus grande distance)

- Δ{a, b, c, d, g} = 4
- Δ{e} = 0
- Δ{f} = 0