Grafo = G(V,E)

Conjunto de aristas

Conjunto Vertices

$E \subseteq |V|^2$

(v_i, v_j)

No dirigidos, la tupla no es ordenada

Dirigidos, la tupla es ordenada

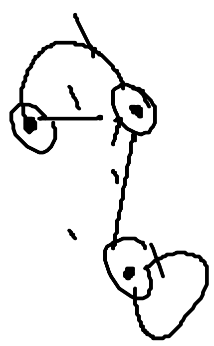
Teoria en grafos no dirigidos

Grado de un vértices

$\delta(v_i) = \#$ aristas

Teorema de Handshaking

$$2e = \sum_{v_i \in V} \delta(v_i)$$



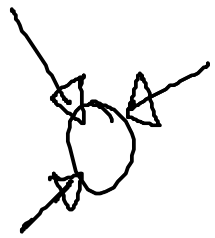
$2e = 2 + 3 + 3 = 8$

$e = 4$

Teorema de Handshaking para grafos dirigidos

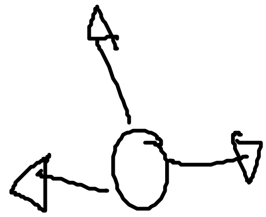
Grado de entrada de un vértices

$$\delta^+(v_i)$$



Grado de salida de un vértices

$$\delta^-(v_i)$$

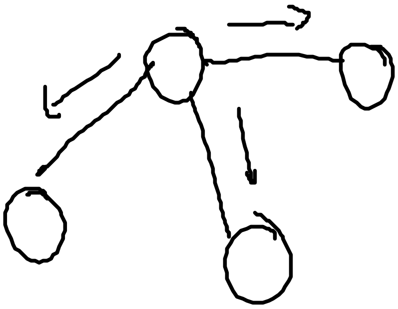


$$e = \sum_{v_i \in V} \delta^+(v_i) = \sum_{v_i \in V} \delta^-(v_i)$$

Familias de grafos simples

Completos

K_n

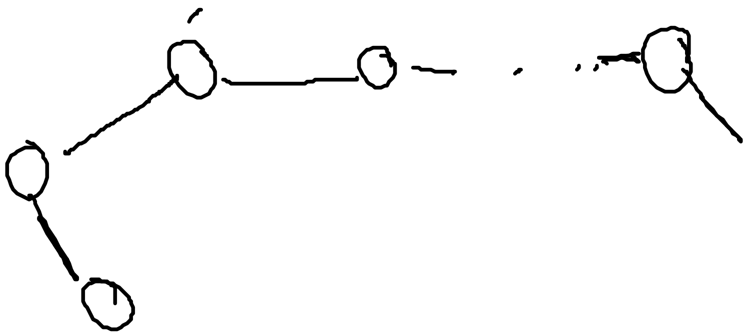


$$2e = \sum_{v_i \in V} \delta(v_i)$$

$$e = \frac{n(n-1)}{2} \leftarrow 2e = \sum_{v_i \in V} (n-1)$$

Ciclos

C_n



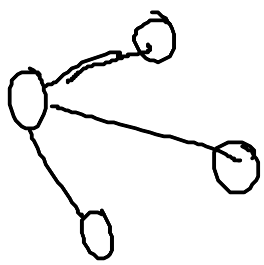
$2e = n2$

$e = n$

W_n

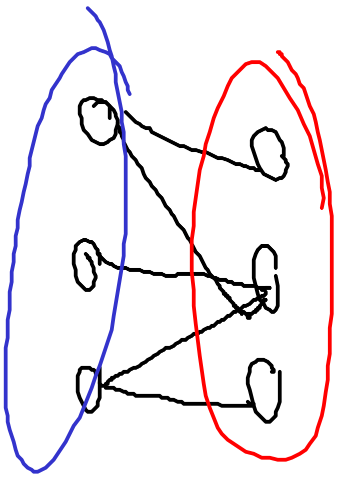
Rueda

$n+1$ vertices

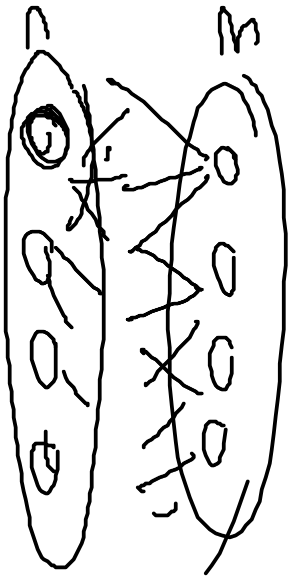


$2e = 3n + n$ $\quad 2e = 4n \quad e = 2n$

Bipartitos



$K_{n,m}$



$$2e = m \times n + n \times m$$

$$e = m \times n$$

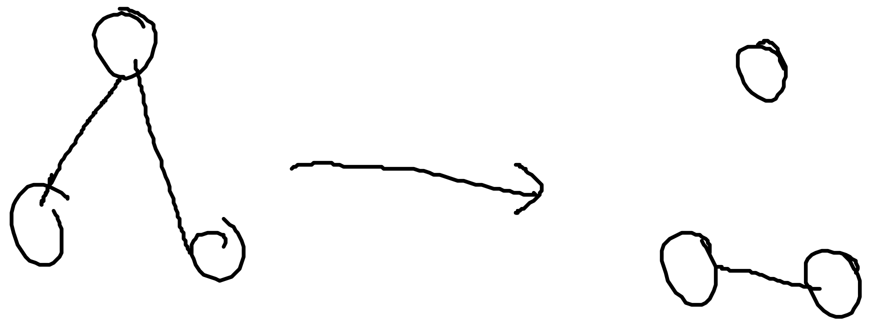
Eliminación de vertices: eliminar las aristas que son incidentes a el

Eliminación de aristas: simplemente elimina la arista

Grafos complementarios.

Es generar un grafo nuevo con los mismos vertices y las aristas faltantes para que el grafo sea completo

G_1 $\qquad\qquad$ G_1'



$K_n \longrightarrow$ Sin aristas

Grafo completo

$\delta(v_i) + ? = n - 1$

$? = (n-1) - \delta(v_i)$

$\overline{W_n} = \qquad 3 + \underbrace{3 + 3 + \dots + 3}_{n \text{ vece}} + n$

n - 3 + n - 3 + n - 3 + --- + n - n

$\dfrac{n+1}{\text{Verticas}}$ $\qquad n(n-3) \rightarrow n^2 - 3n$