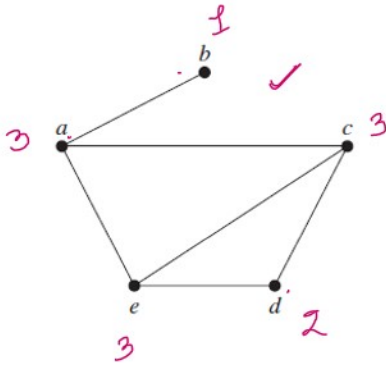


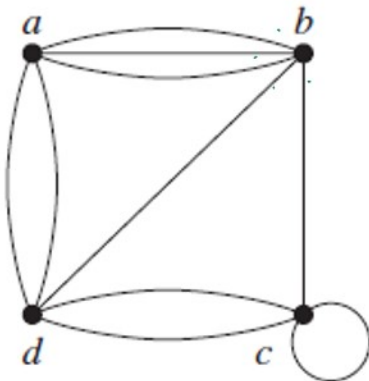
Representation of Graphs with Matrices :-

1) Adjacency Matrix



$$\begin{array}{c} \text{Columns} \\ \downarrow \downarrow \downarrow \\ \text{Rows} \Rightarrow \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \\ \underline{\underline{3 \times 3}} \end{array}$$

	a	b	c	d	e	
a	0	1	1	0	1	→ 3
b	1	0	0	0	0	→ 1
c	1	0	0	1	1	→ 3
d	0	0	1	0	1	→ 2
e	1	0	1	1	0	→ 3

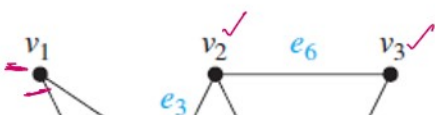


	a	b	c	d	
a	0	3	0	2	→ 5 deg(a)
b	3	0	1	1	→ 5 deg(b)
c	0	1	1	2	→ 5 deg(c)
d	2	1	2	0	→ deg(d)=5

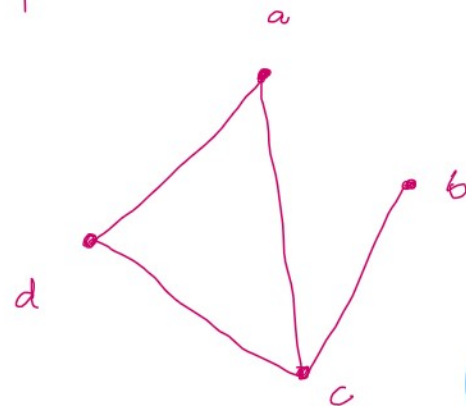
Adjacency Matrix

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

* Incidence Matrix

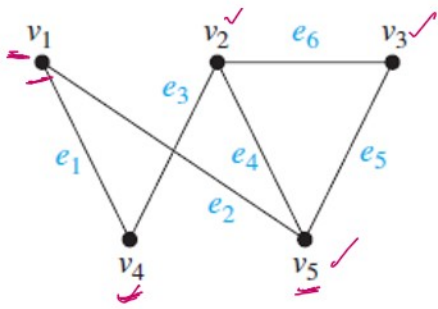


	e ₁	e ₂	e ₃	e ₄	e ₅	e ₆
v ₁	1	1	0	0	0	0
v ₂	1	1	0	0	0	0
v ₃	0	0	1	0	0	0

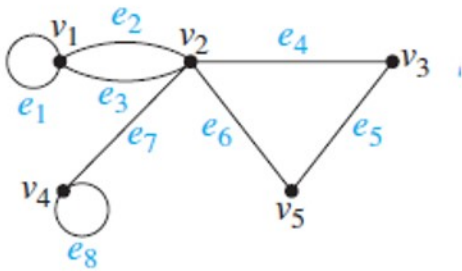


$$a_{ij} = a_{ji}$$

	a ₁₁	a ₁₂	a ₁₃
a ₂₁			
a ₃₁			



	e_1	e_2	e_3	e_4	e_5	e_6
u_1	1	1	0	0	0	0
u_2	0	0	1	1	0	1
u_3	0	0	0	0	1	1
u_4	1	0	1	0	0	0
u_5	0	1	0	1	1	0

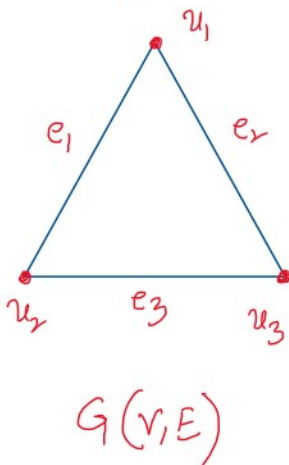


	e_1	e_2	e_3	e_4	e_5	e_6	e_7	e_8
u_1	1	1	1	0	0	0	0	0
u_2	0	1	1	1	0	1	1	0
u_3	0	0	0	1	1	0	0	0
u_4	0	0	0	0	0	0	1	1
u_5	0	0	0	0	1	1	0	0

Subgraph \rightarrow

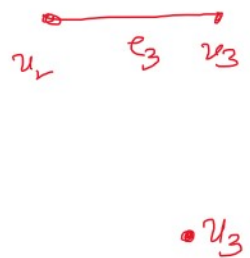
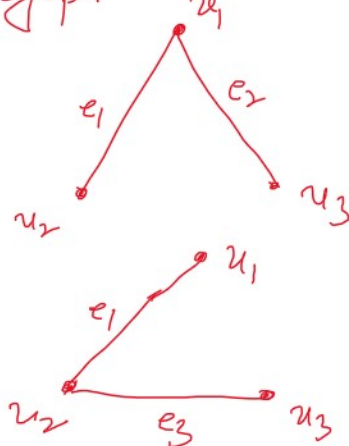
A subgraph of a graph $G = G(V, E)$ is a graph $H = H(V', E')$ where $V' \subseteq V$ and $E' \subseteq E$

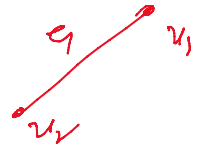
A subgraph H of G is a proper subgraph if $H \neq G$.



\rightarrow

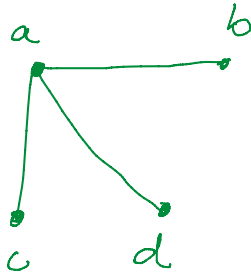
Subgraph





v_2

The total no. of subgraphs of this graph



→ (34) Subgraphs

