

Representation of Graphs with the help of Matrices :-

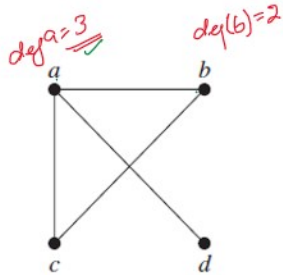
Row →

Column ↓

1	2	3
4	5	6
7	8	9
2	3	4

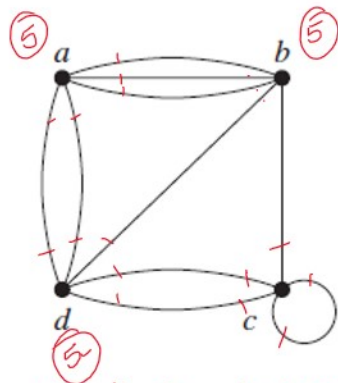
4 × 3

1) Adjacency Matrices



	a	b	c	d	
a	0	1	1	1	→ Sum = 3
b	1	0	1	0	→ Sum = 2
c	1	1	0	0	→ Sum = 2
d	1	0	0	0	→ Sum = 1

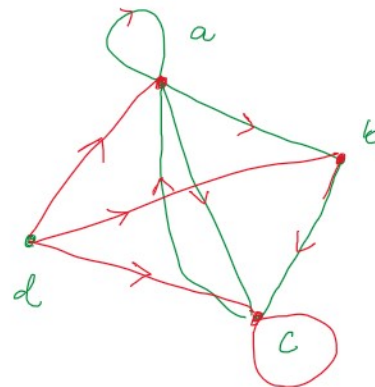
$a_{ij} = a_{ji}$



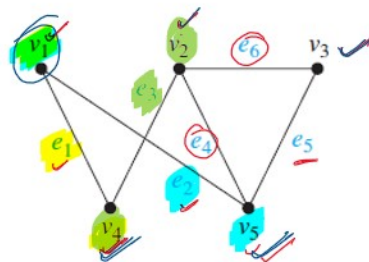
	a	b	c	d	
a	0	3	0	2	→ 5
b	3	0	1	1	→ 5
c	0	1	1	2	→ 1 + 2(1) + 2 = 5
d	2	1	2	0	→ 5

Draw the graph for adjacency matrix

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



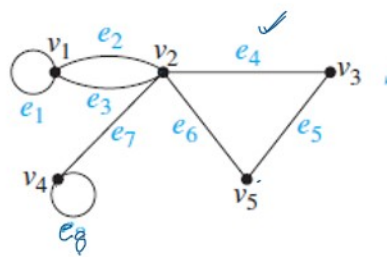
* Incidence Matrix :->



	e_1	e_2	e_3	e_4	e_5	e_6	
→ v_1	1	1	0	0	0	0	→ Sum = 2
→ $3 \leftarrow v_2$	0	0	1	1	0	1	
→ $2 \leftarrow v_3$	0	0	0	0	1	1	
→ $2 \leftarrow v_4$	1	0	1	0	0	0	
→ $3 \leftarrow v_5$	0	1	0	1	1	0	

v_1 e_2 v_2

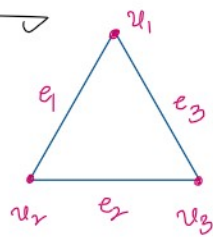
	e_1	e_2	e_3	e_4	e_5	e_6	e_7	e_8
...	1	1	1	0	0	0	0	0



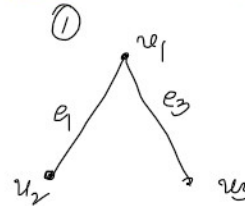
	e_1	e_2	e_3	e_4	e_5	e_6	e_7	e_8
v_1	1	1	1	0	0	0	0	0
v_2	0	1	1	1	0	1	1	0
v_3	0	0	0	1	1	0	0	0
v_4	0	0	0	0	0	0	1	1
v_5	0	0	0	0	1	1	0	0

Subgraph of a graph :-

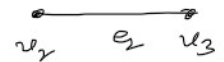
A subgraph of a graph $G(V, E)$ is the graph $H(V_1, E_1)$ such that $V_1 \subseteq V$ and $E_1 \subseteq E$.



Subgraph



②



③

