lecture 23:-   CUBOID.

        110   111

    10 _____ 11
                          010   011
                                  100   101
    o _____ 1
    00   01   000   001

    Q1   Q2   Q3

Nodes = 2²⁰   Nodes = 2²   00   Nodes = 2³   000
    2   1   4   01   8 |
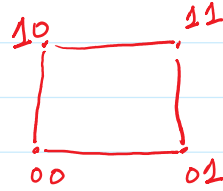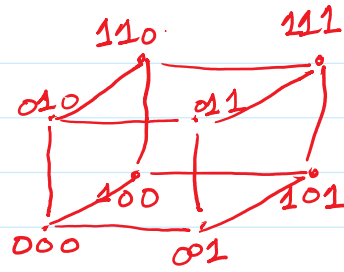   10 |
                               11   111.

$$Edges = \frac{2^N \times N}{2}$$

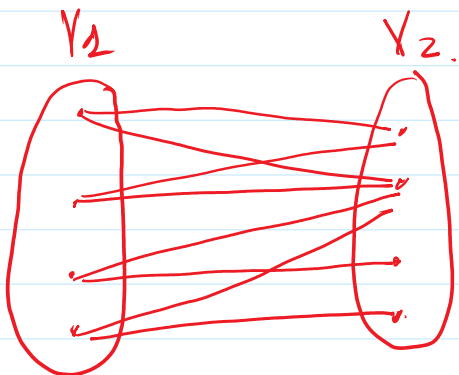Bipartite:-   A Simple Graph is bipartite
                Y it can be divided into two disjoint
                        V1 and V2
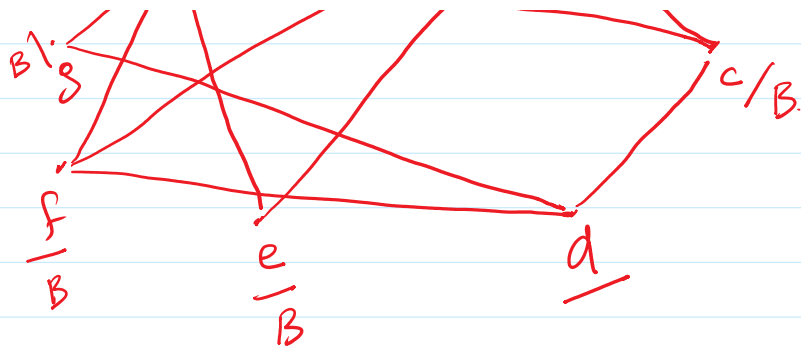   → All edges in the Graph are btw a
                Vertex in V1 to V2.
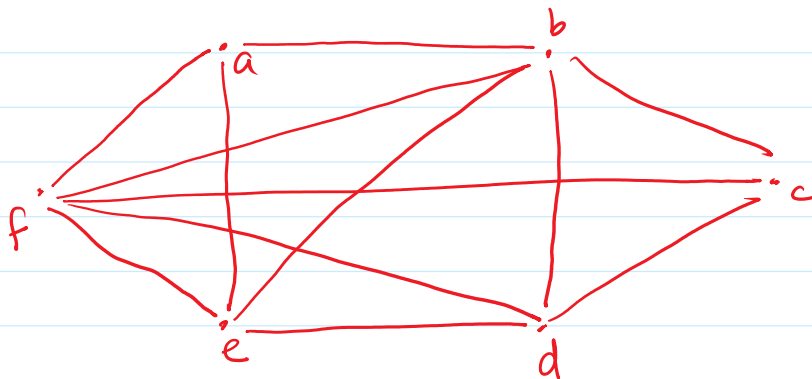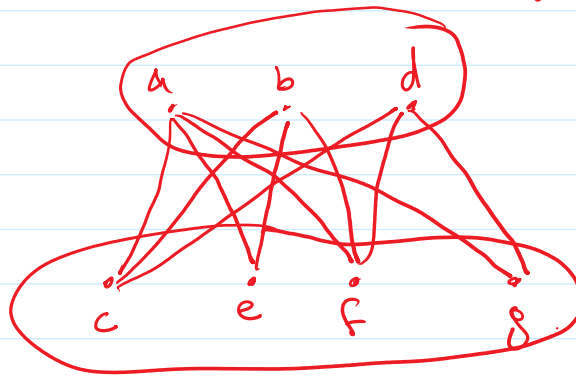   → and there is no edges btw the Vertices
                of V1 & V2.

    V1   V2.

Ex11
P54.

            R   R
            /a   /b.

    B|.
     g   /C/R

B1. g   c/B.

f
B   e
     B   d

R $\{a, b, d\}$

B $\{c, e, f, g\}$

Complete Bipartite Graph.

$K_{2,2}$ Vertices   Edges.
                                           2+2   2×2

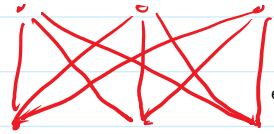$K_{2,3}$ 2+3   2×3

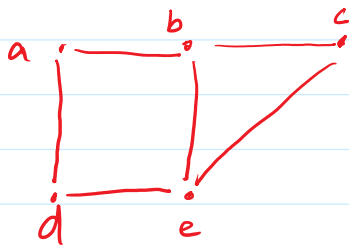$K_{3,3}$ 3+3   3×3.

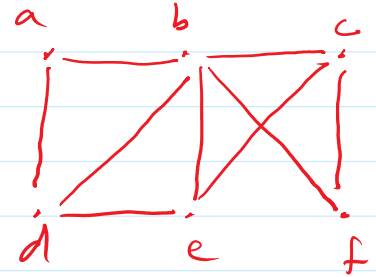$K_{3,3}$

3+3   3×3.

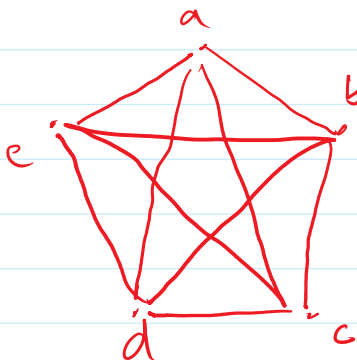$K_{m,n}$

m + n   m × n.
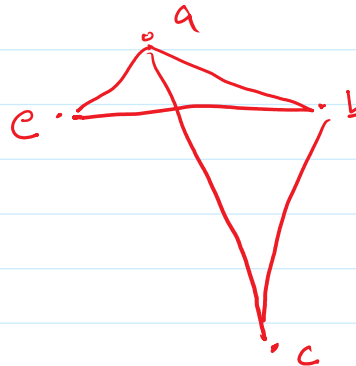
Union of Graphs.

G1
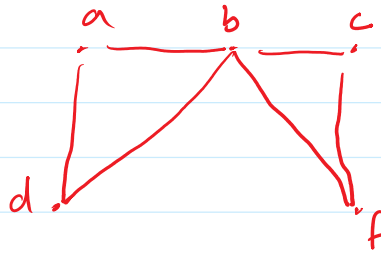
G2.

$G_1 \cup G_2$.

Sub Graph.

$G = (V, E)$

$H = (W, F)$

$W \subseteq V$ ✓

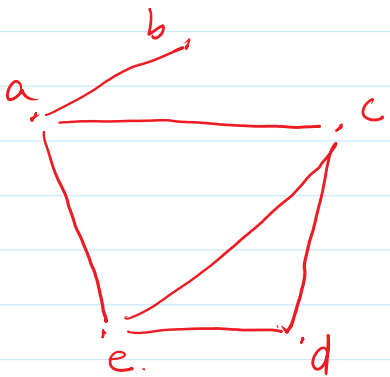$F \subseteq E$.

$V = \{a, b, c, d, e\}$
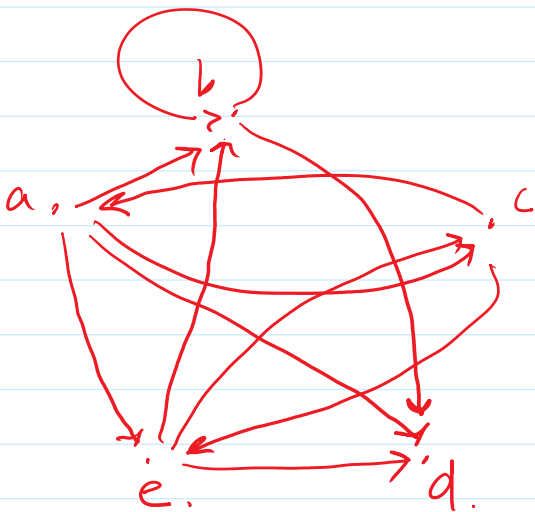
$W = \{a, b, c, e\}$.

$F = \{(a,b), (a,c), (a,e)$

$- - - \}$.

ε

$E = \{(a,b), (a,c), (a,d)$

$- - - \}$.

G

H.

Graph Representation.

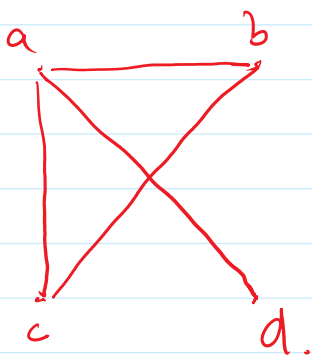# 1- Adjacency list.

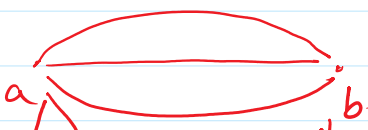| Vertices	Adjacent Vertices.
a	b,c,e
b	a
c	a,d,e
d	c,e
e	a,c,d.

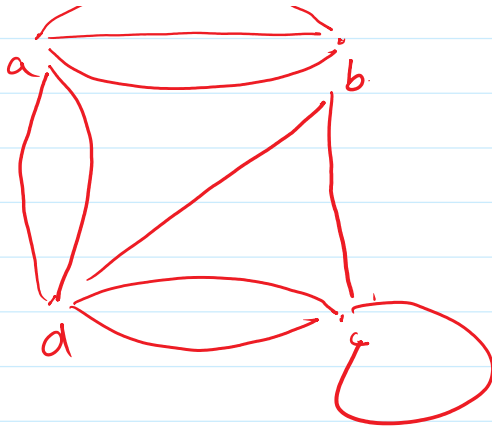| Initial Vertex	Terminal Vertex.
a	b, c, d, e
b	b, d
c	a, c, e
d	
e.	b, c, d.

Adjacency Matrix.

Rows = Col = Vertices

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

	a	b	c	d.
a	0	3	0	2

$$\begin{array}{c} a \\ b \\ c \\ d \end{array} \begin{bmatrix} 0 & 3 & 0 & 2 \\ 3 & 0 & 1 & 1 \\ 0 & 1 & 1 & 2 \\ 2 & 2 & 2 & 0 \end{bmatrix}$$