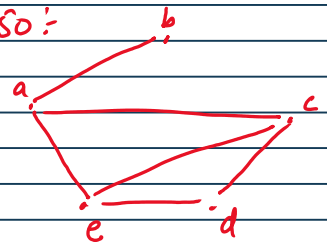
lecture 21:- p545 - 546.

Representing Graph

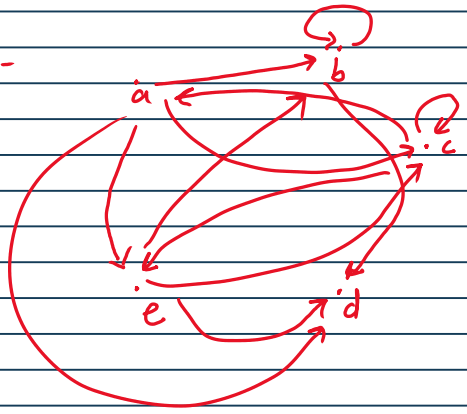
1- Adjacency list

Ex1: p550 :-



Vertex	Adjacent Vertex.
a	b, e, c
b	a
c	a, c, d
d	e, c
e	a, c, d

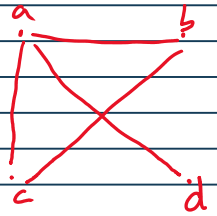
Ex2 :- p550



Initial Vertex	Terminal Vertex
a	b, c, e, d
b	b, d,
c	a, c, e
d	—
e	d, c, b

2- Adjacency Matrix. $|V| = n \times n$. (rows x col)

Ex3 :- p552



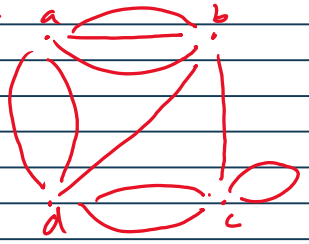
4x4.

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

Properties:-
- if all diagonal entries are zero's then No loop.
- if the matrix is one-zero matrix then multiplicity = 1.
- if diagonal zo's & one-zero matrix then Simple Graph.
- For Undirected Graph.

- For Undirected Graph. adjacency matrix will always be a Symmetric.

Ex5 P551.



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

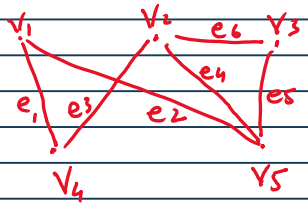
3- Incident Matrix.

$|V| \times |E|$.

↓ ↓

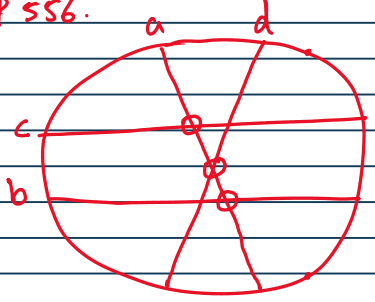
rows × cols.

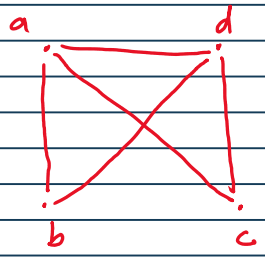
Ex6 P553.



	e_1	e_2	e_3	e_4	e_5	e_6	
V_1	1	1	0	0	0	0	2
V_2	0	0	1	1	0	1	3
V_3	0	0	0	0	1	1	2
V_4	1	0	1	0	0	0	2
V_5	0	1	0	1	1	0	3

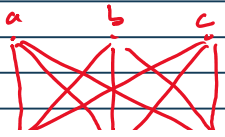
Circular Graph. P556.

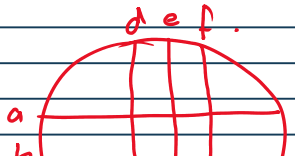


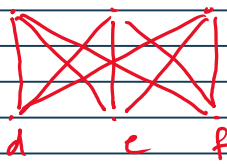


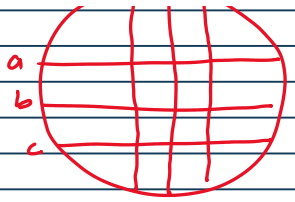
	a	b	c	d
a	0	1	1	1
b	1	0	0	1
c	1	0	0	1
d	1	1	1	0

$K_{3,3}$.









K_5, K_4, W_3, C_4.

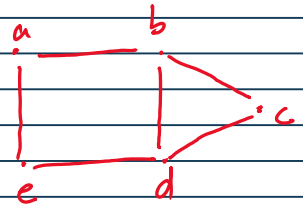
Ex P556 1 - 50.
Ex P546 1 - 40.

CONNECTIVITY :-

PATH : ∃ a path from 'a' to 'b' in the Graph (V, E) if -

∃ a Sequence of edges Such that (a, x_1) (x_1, x_2) ---- (x_{n-1}, x_n), (x_n, b).

Ex 1 P560.

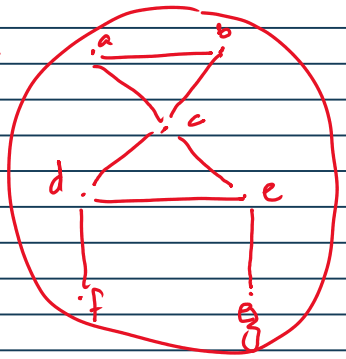


a, b, d, e, a. 4.
(a,b) (b,d) (d,e), (e,a) 4.

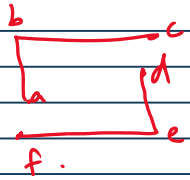
Connectedness in a Graph.

Connected : A Graph is Connected if ∃ a path btw every pair of distinct Vertices.

Ex 6 P563.

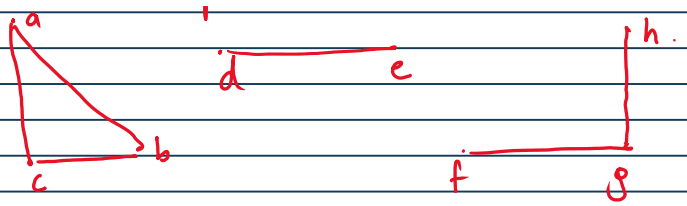


Connected.



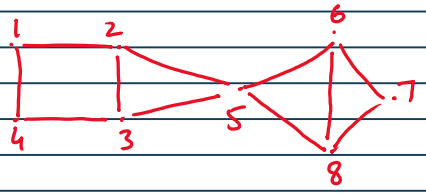
Not Connected.

Connected Component.

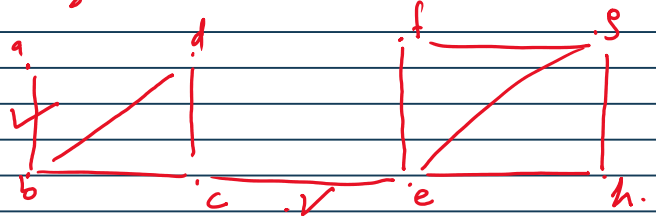


Cut Vertex :-

P564.

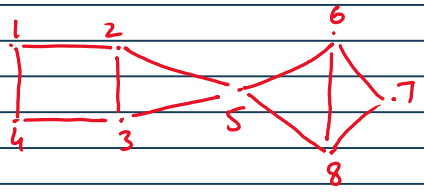


Cut Edges :-



Cut edge.
(a, b)
(c, e)

Cut Set.



Cut Set :
{ (2,5), (3,5) } ?

{ (1,2), (2,3), (3,5) }