* Activity Selection Problem : →
Given a set of activities with their start & finish times, select the max number of activities that can be performed by a single person if he/she can perform only 1 activity at a particular given time.
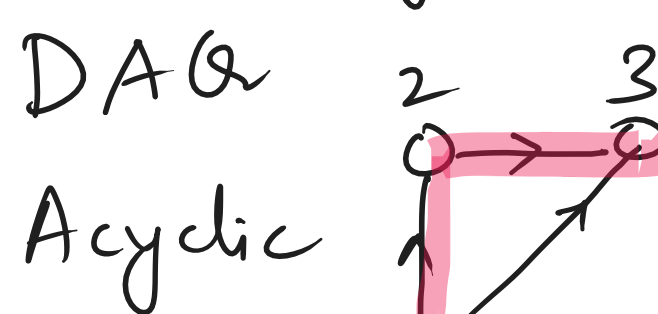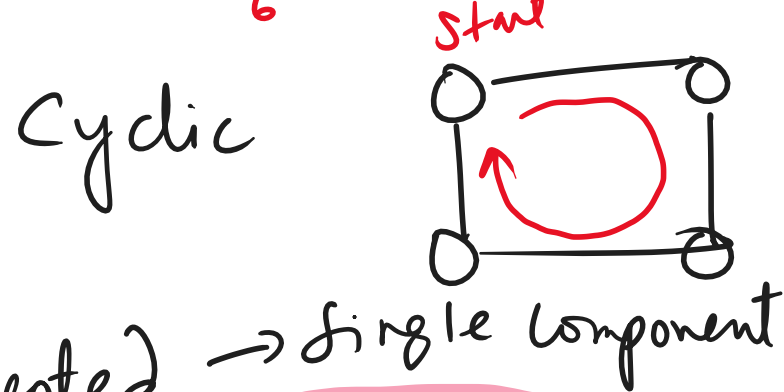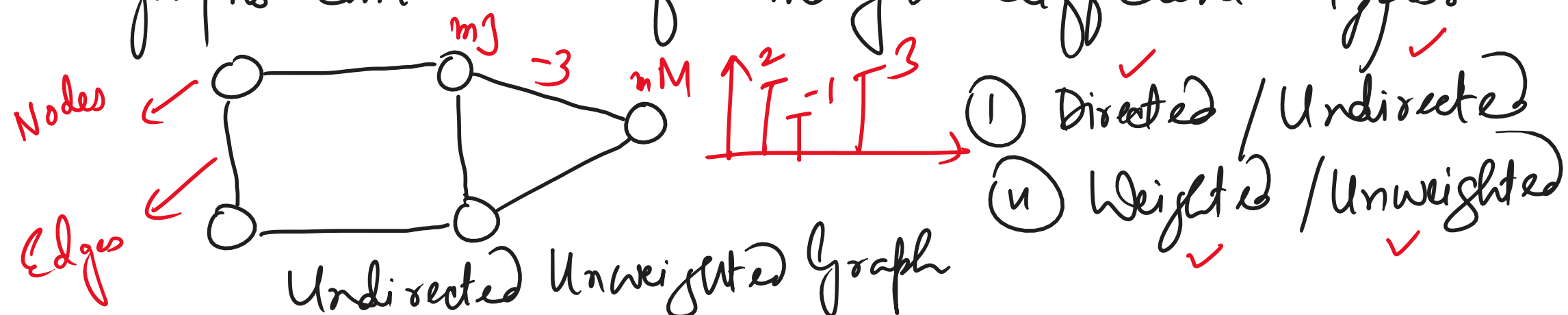
Activity	Start Time	Finish Time	Sort (finish)	Output
A1	5	7	A3 (1,4)	A3 (1,4)
A2	8	9	A6 (3,5)	
A3	1	4	A5 (0,6)	A1 (5,7)
A4	5	9	A1 (5,7)	
A5	0	6	A2 (8,9)	A2 (8,9)
A6	3	5	A4 (5,9)	

Steps : → ✓ Sort according to finish time.
✓ Select the activity that finishes earliest.
✓ Select all other activities whose start time is greater than or equal to the finish time of the previously selected activity without overlapping.
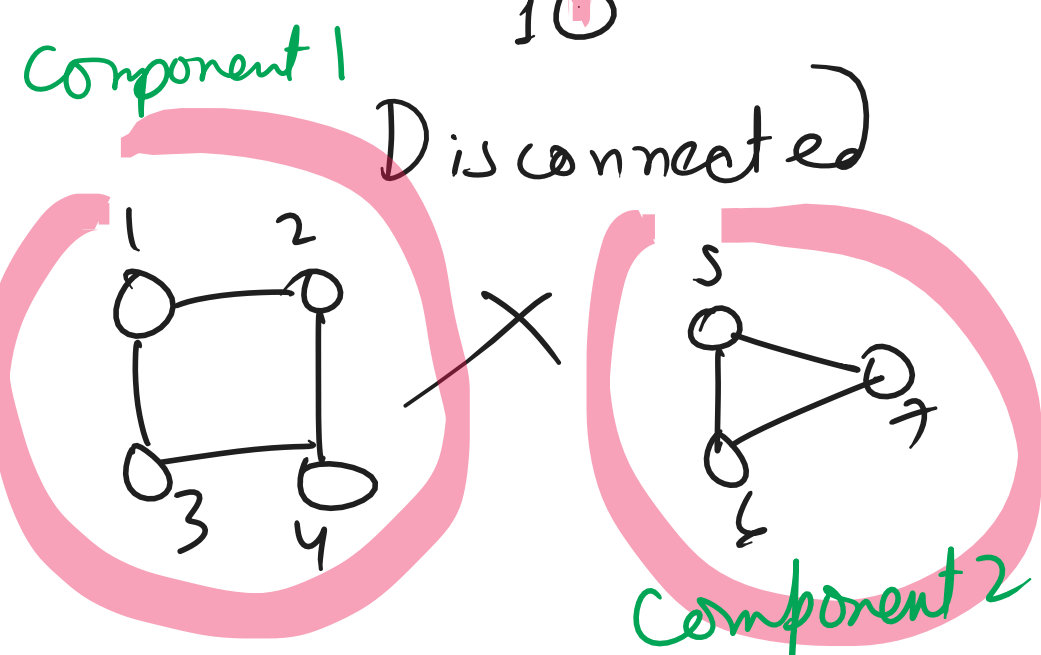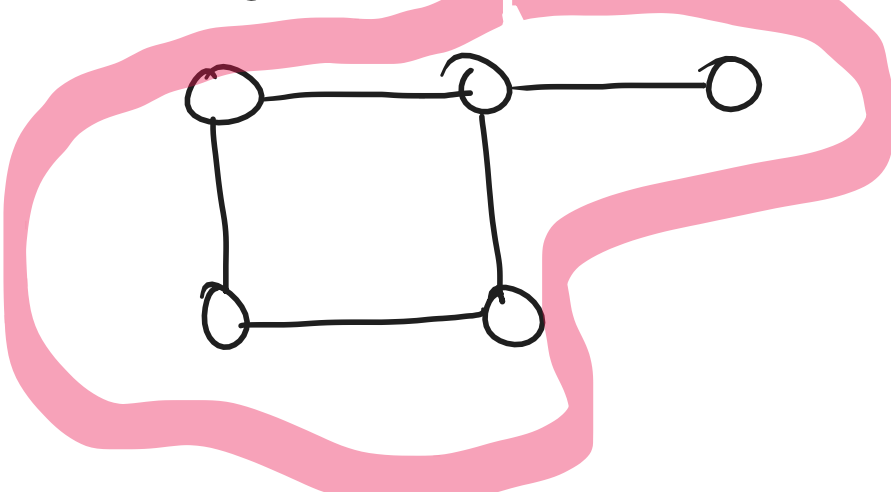
Introduction to Graph Data Structure : →

Definition : → An entity have nodes and edges is called a graph.
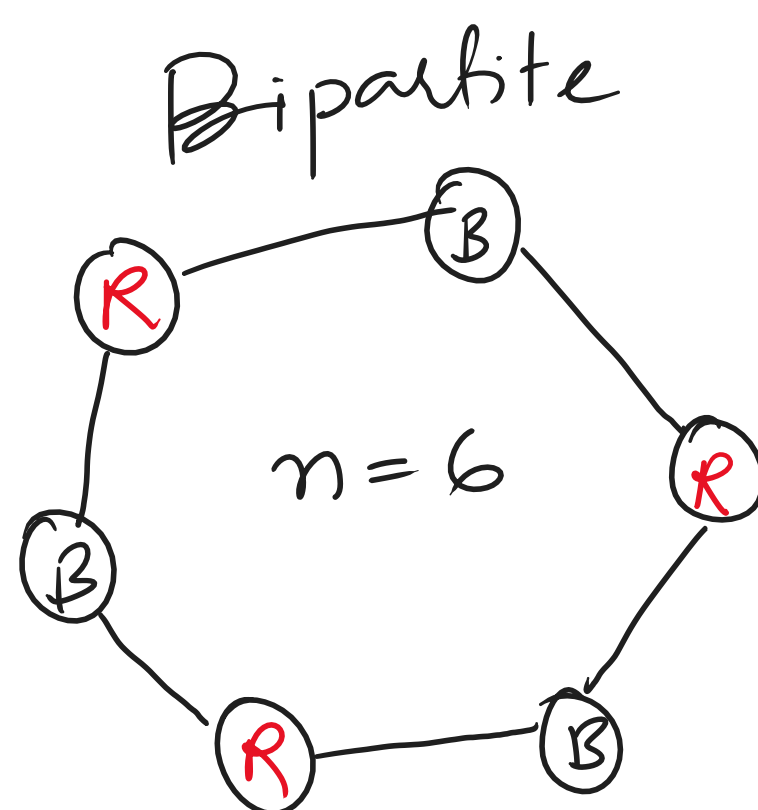Based on the connections of the nodes and edges, graphs can be of many different types.

Nodes ←
Edges ←
Undirected Unweighted Graph

mJ -3 nM

① Directed / Undirected
ⓤ Weighted / Unweighted

Weighted Directed Graph.

Cyclic

start

DAG
Acyclic

Connected → Single component

Component 1
Disconnected

Component 2

Bipartite Graphs:

B
R   R
n = 5
R   B

adj nodes same color. Not Bipartite

Bipartite

R   B
B   R
n = 6
R   B
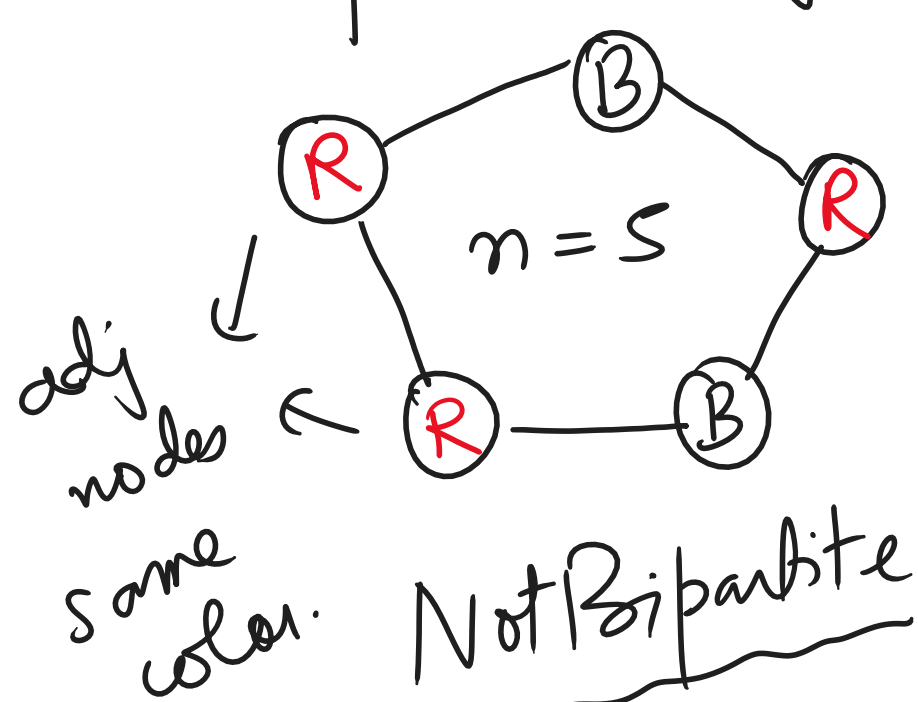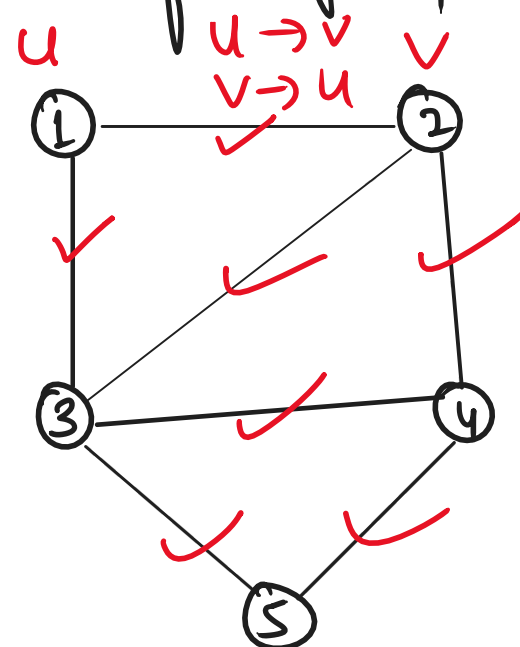
Cyclic { Graphs with even nodes is always bipartite.
         Graphs with odd nodes are always un-bipartite.

Representation of Graphs : →

Adjacency Matrix
n×n = 5×5

	1	2	3	4	5
1	0	1	1	0	0
2	1	0	1	1	0
3	1	1	0	1	1
4	0	1	1	0	1
5	0	0	1	1	0

u u→v v
v→u

Adjacency List

Node :	List of Neighbours
1 :	2, 3
2 :	1, 3, 4
3 :	1, 2, 4, 5
4 :	2, 3, 5
5 :	3, 4