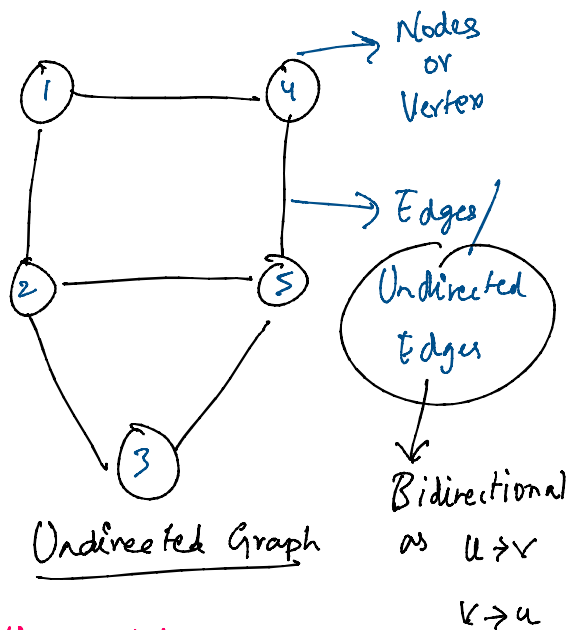


1. Introduction to Graph | Types | Different Conventions Used

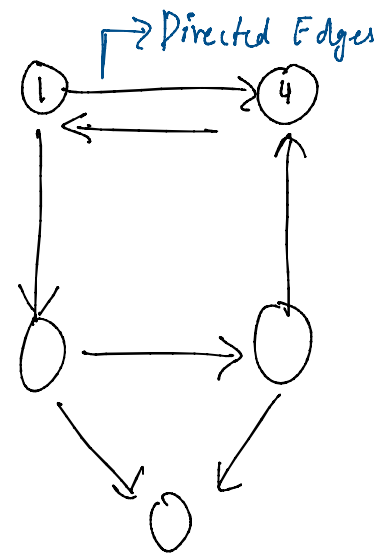
Types of Graph :



Undirected cyclic graph

Nodes/Vertex (N/V) $\Rightarrow 5$

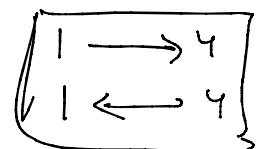
Edges $\Rightarrow 6$



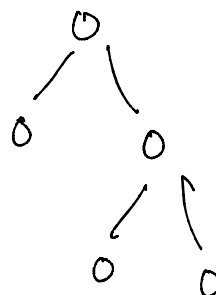
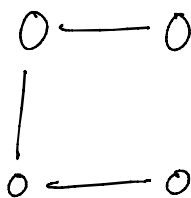
Directed Graph

\Rightarrow where all the edges are directed.

\Rightarrow there can be multiple directed graph.



* Cycles in a Graph:

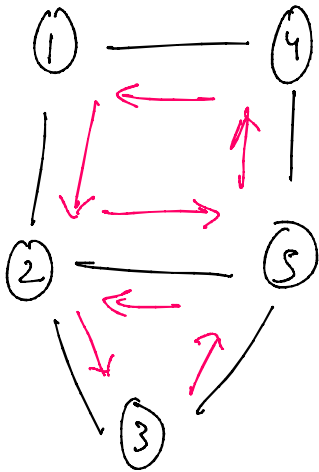


Binary Tree and Graph as it follows all rules.

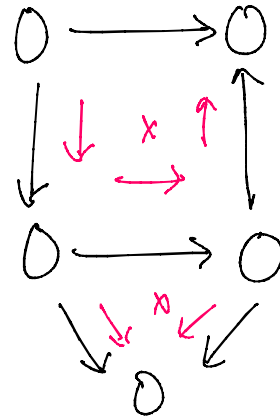
Cycle: - If you're starting from a node you reach back to that node.

- Start from a node and end at that node.

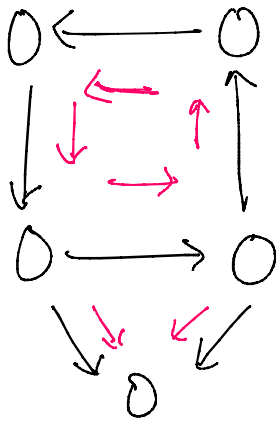
Undirected cyclic graph



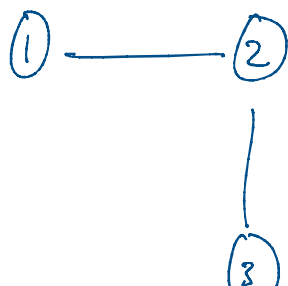
Acyclic Graph: No cycle graph.



Directed acyclic Graph (DAG)



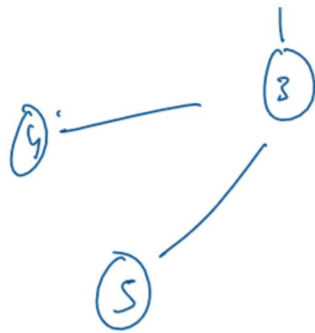
† Path: Contain a lot of nodes and each of them are reachable.



Path

1 2 3 5 ✓

1 2 3 2 1 x

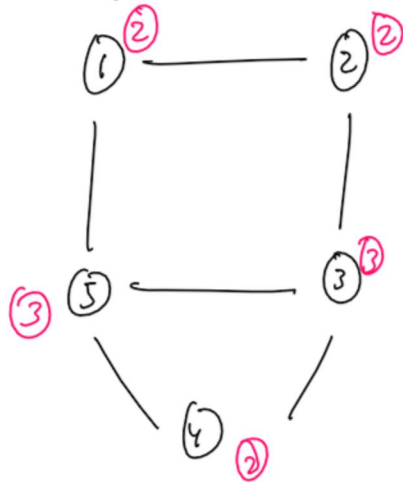


1 2 3 2 1 X
1 3 5 X

* A node **can't** appear **twice** in a path.

* Adjacent nodes must have an edge between them.

* Degree in a Graph: Number of edges that go inside that or go outside that total e.g. 1 2 3 which is attached to '3' so degree of '3' is 3.



$$D(3) = 3$$

$$D(4) = 2$$

$$D(1) = 2$$

Degree of Undirected Graph: Number of edges that are attached to it.

Property of Degree:

$$\text{Total Degree of a graph} = 2 \times \text{Edges}$$

$$\text{Total degree} = 2 + 2 + 3 + 3 + 2 = 12$$

$$\text{Edges} = 6$$

$$T.D = 2 \times E$$

$$T.D = 2 \times 6$$

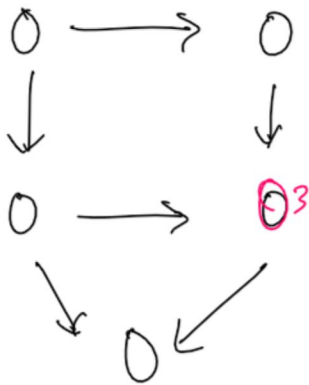
$$= 2 \times 6$$

$$T.D = 12$$

Degree of Directed Graph :

* In degree (node) : No of incoming edges

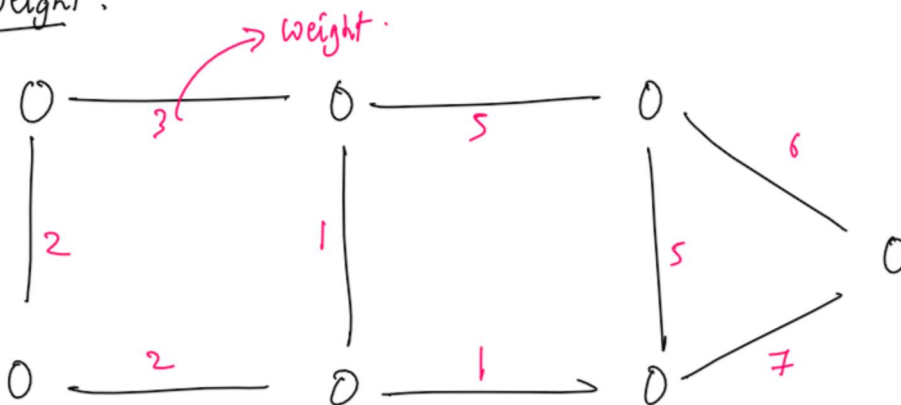
* Out degree (node) : No of out degree edges



$$\text{Indegree}(3) = 2$$

$$\text{Outdegree}(3) = 1$$

* Edges Weight :



If the weight is not assigned then we assign unit weight $\Rightarrow 1$.