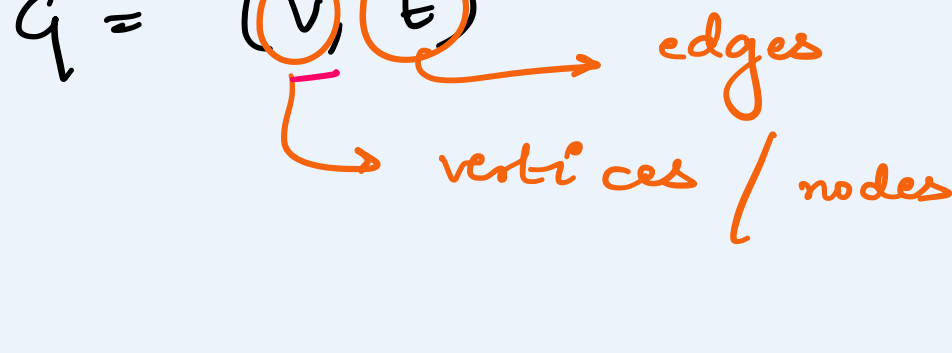
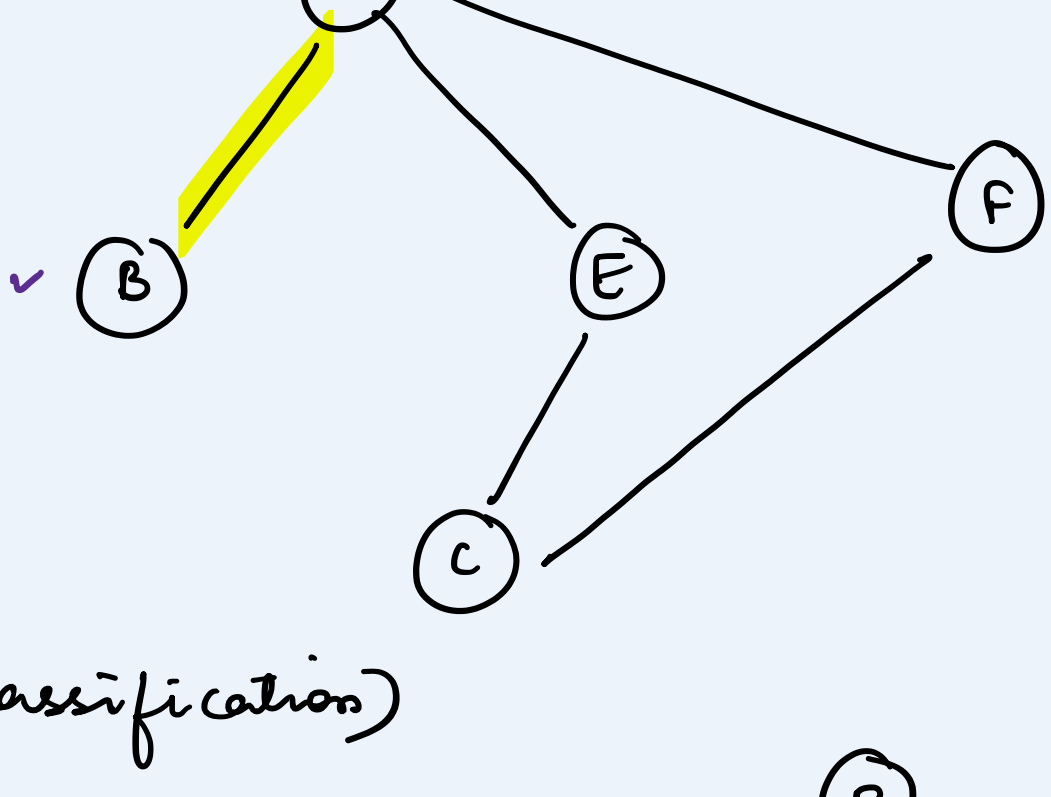


# Graphs

→ collection of **nodes** & edges. each node of the graph is represented as a path b/w 2 edges.

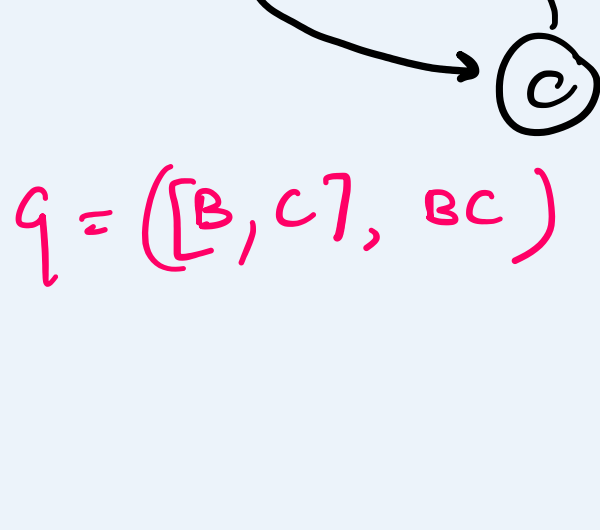
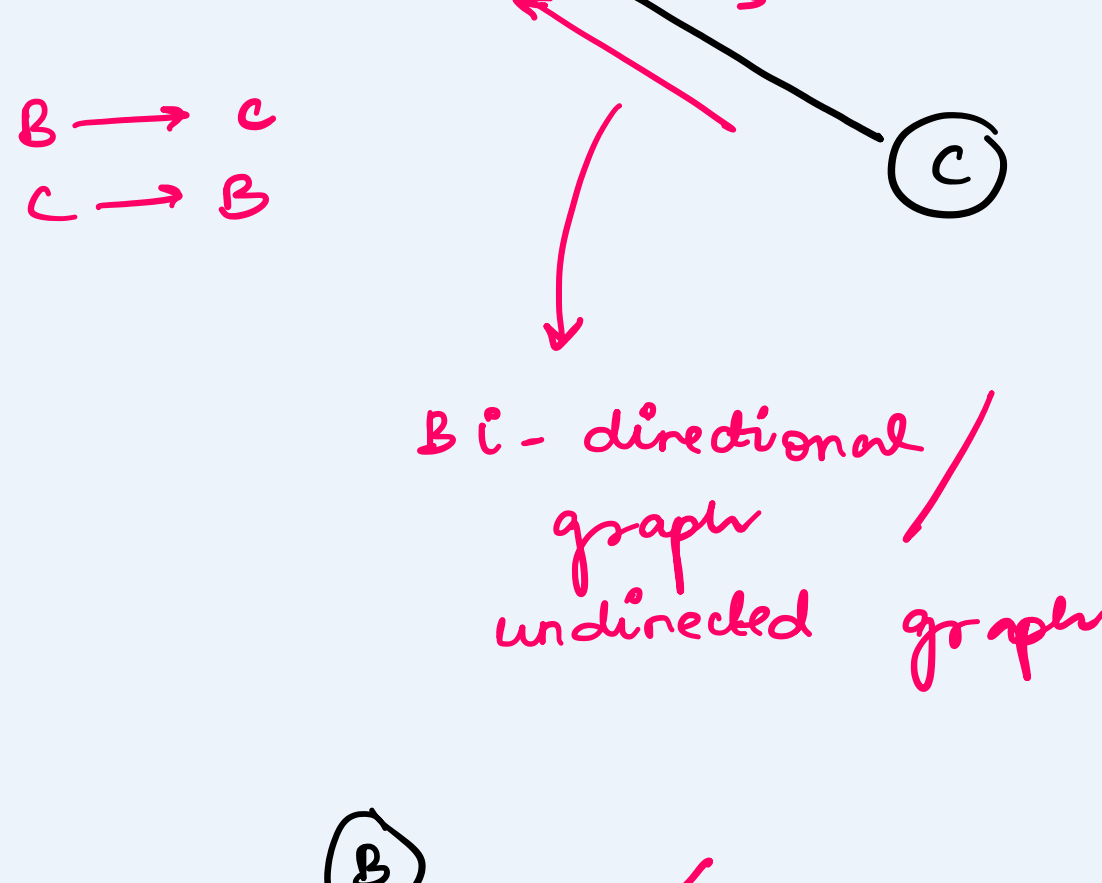


$G = ([A, B, C, E, F], [AB, AE, EC, AF, FC])$



A & B are one of the adjacent nodes

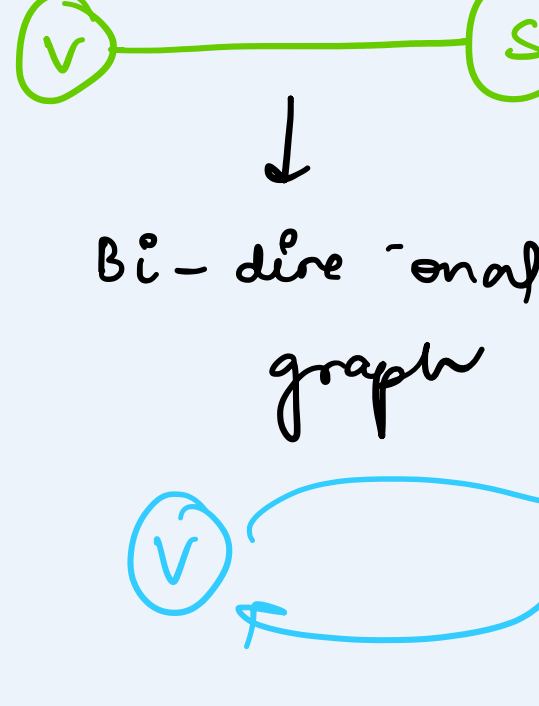
## ① Based on edges (classification)



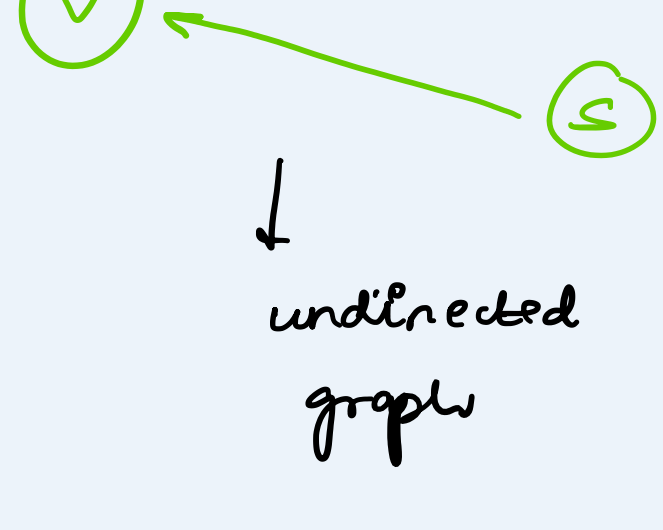
Every graph can be considered as a directed graph.

## Real-life applications of graph

### ① Facebook



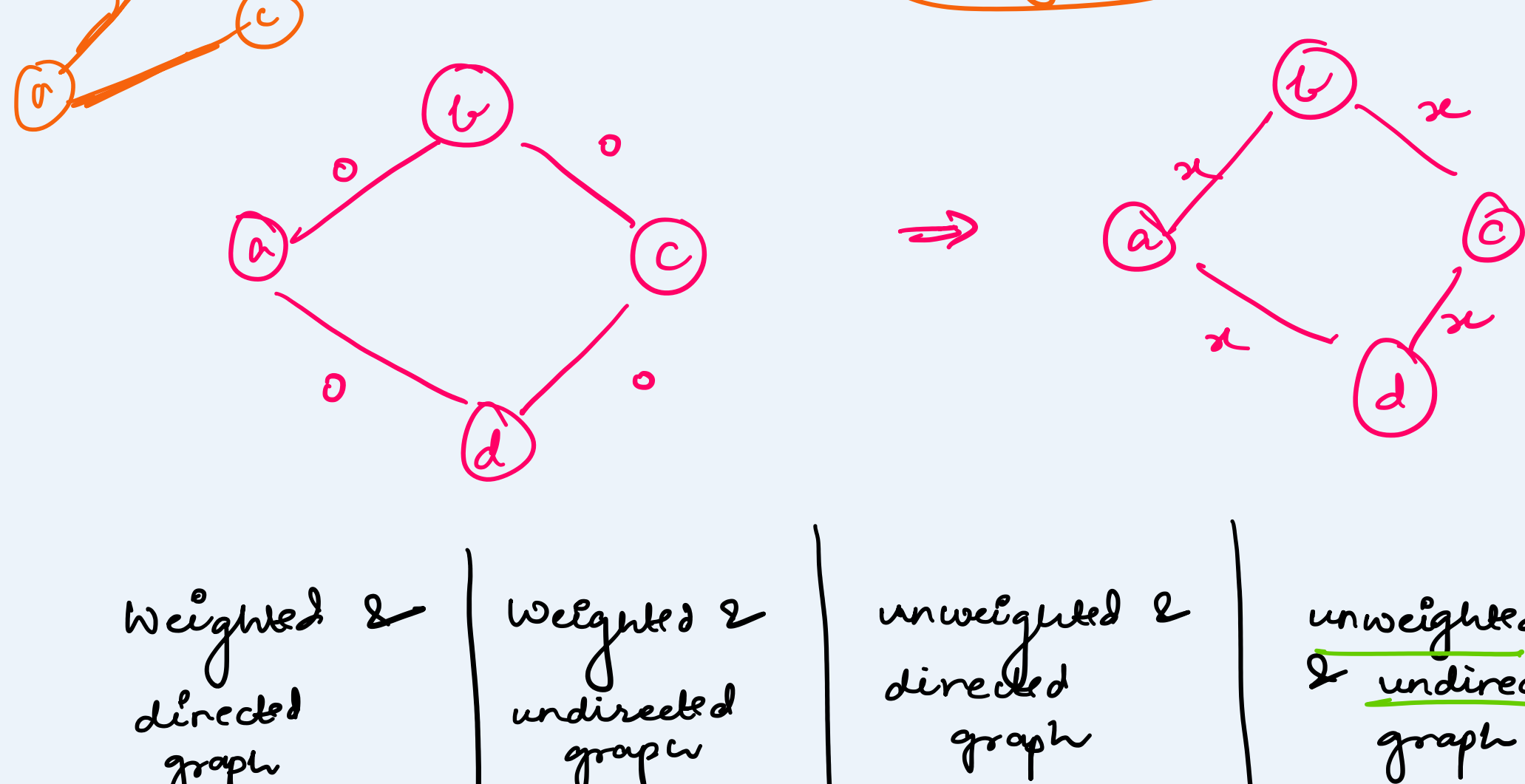
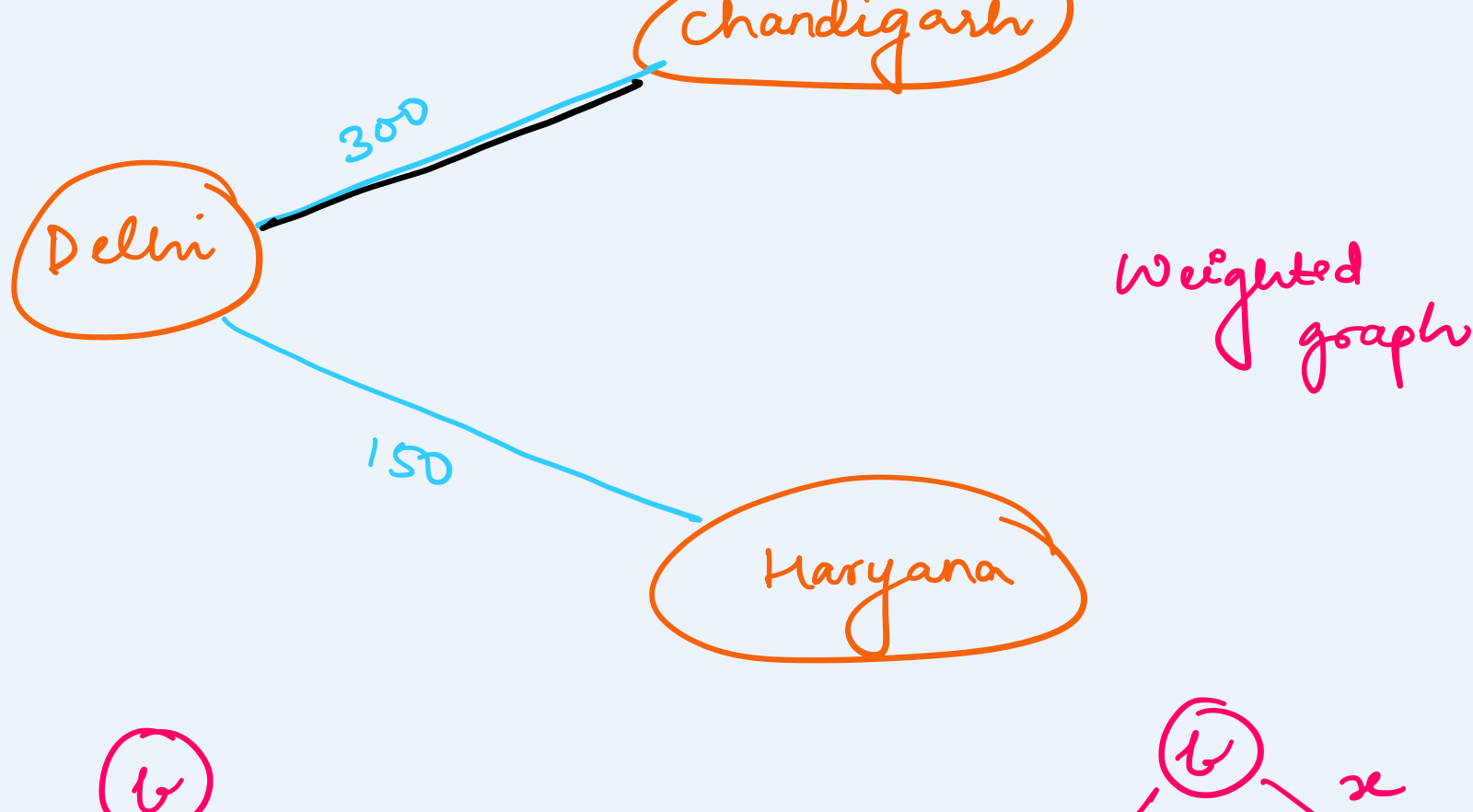
### ② Instagram



## ② Based on edge weights

Weighted → assign attributes to the edges of a graph.  
 → quantifiable  
 → comparable

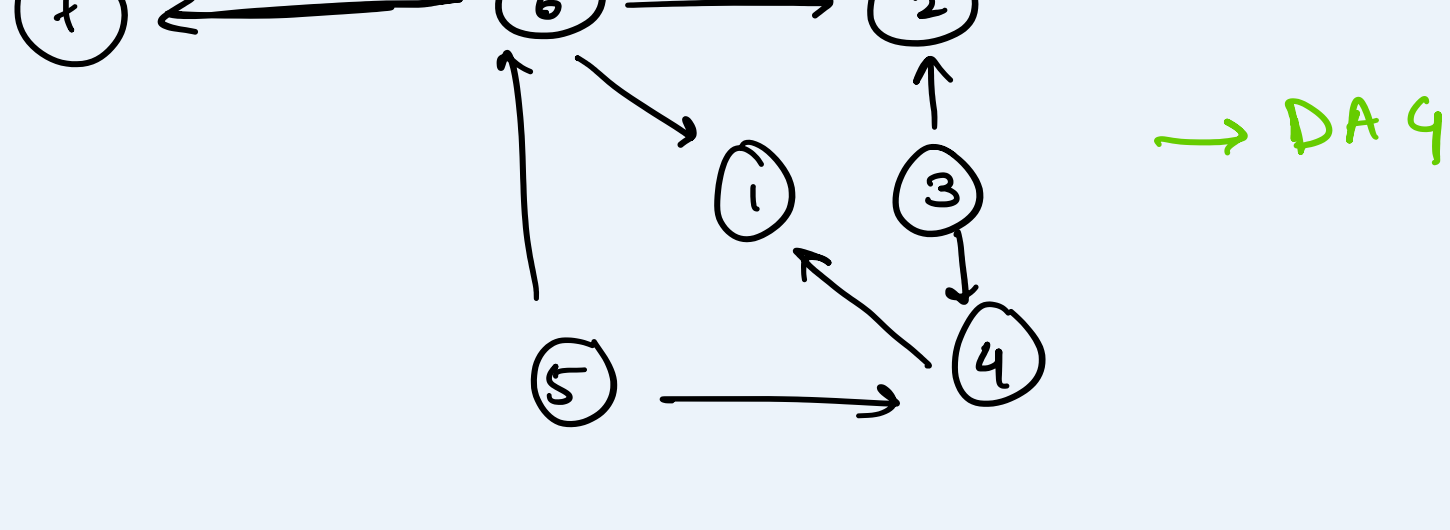
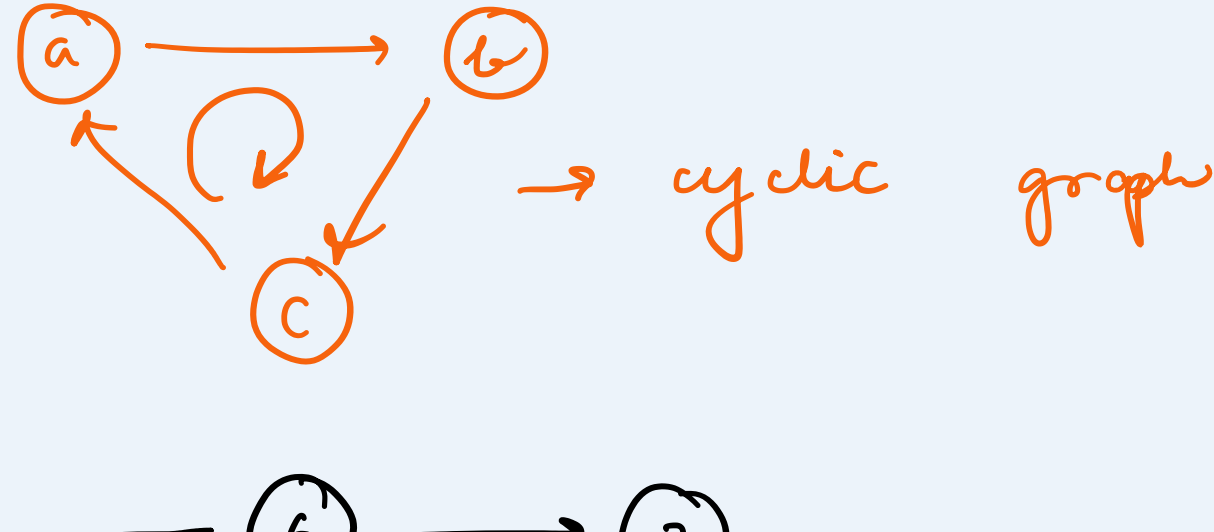
Unweighted



Weighted & directed graph	Weighted & undirected graph	unweighted & directed graph	unweighted & undirected graph
<u>splitwise</u>	<u>google maps</u>	<u>Instagram</u>	<u>Facebook</u>

## Directed Acyclic graph (DAG)

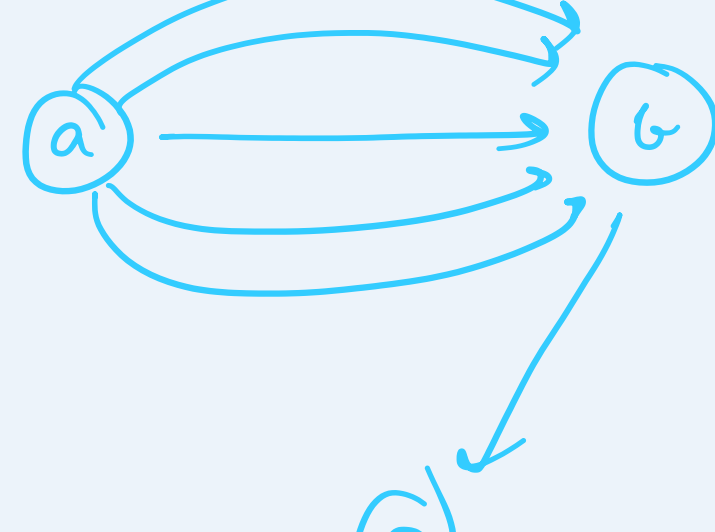
DAG is a graph that contains no cycles



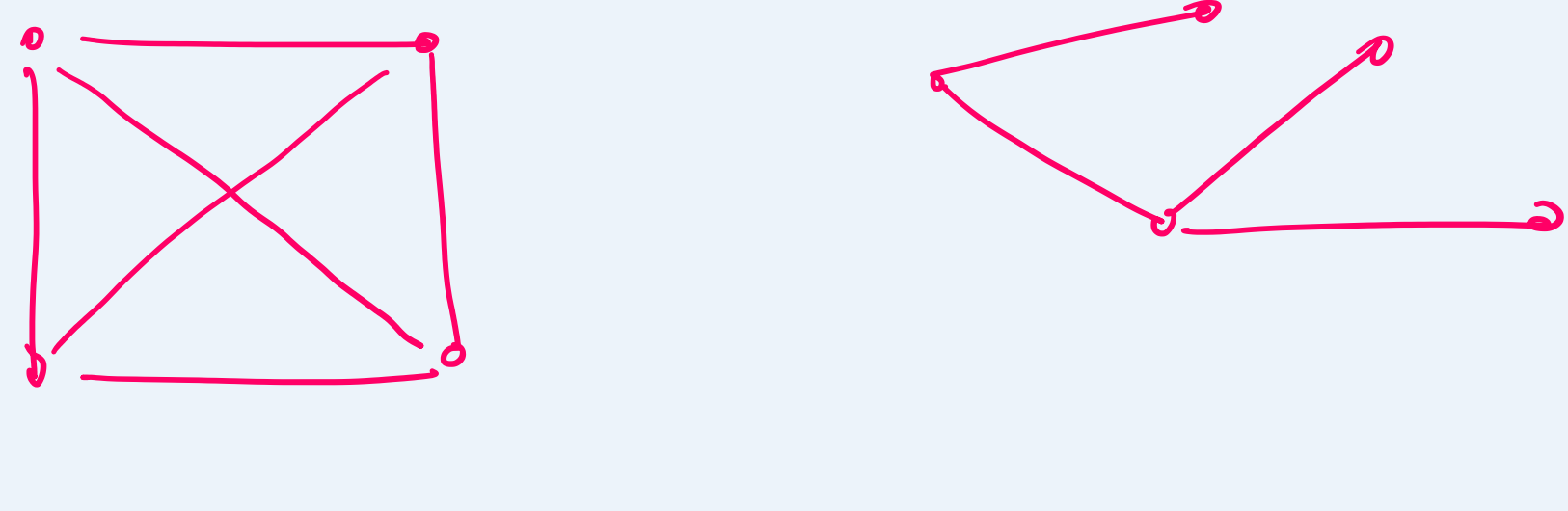
## Multi-graph

A multi-graph is an undirected graph in which **multiple edges** are allowed.

Multiple edges are two or more edges that connect same two vertices.

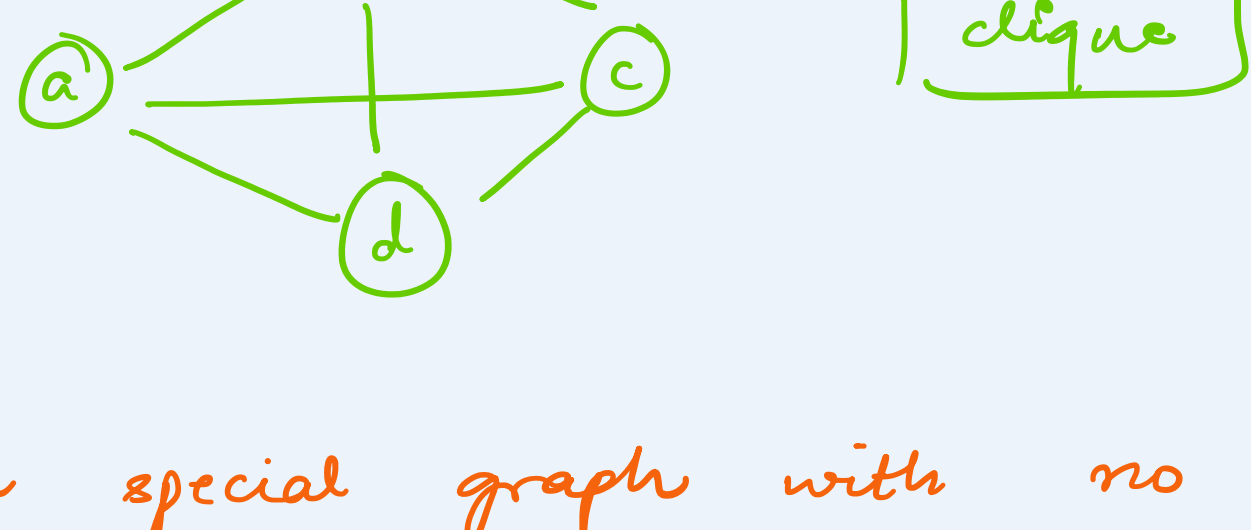


## Simple graph

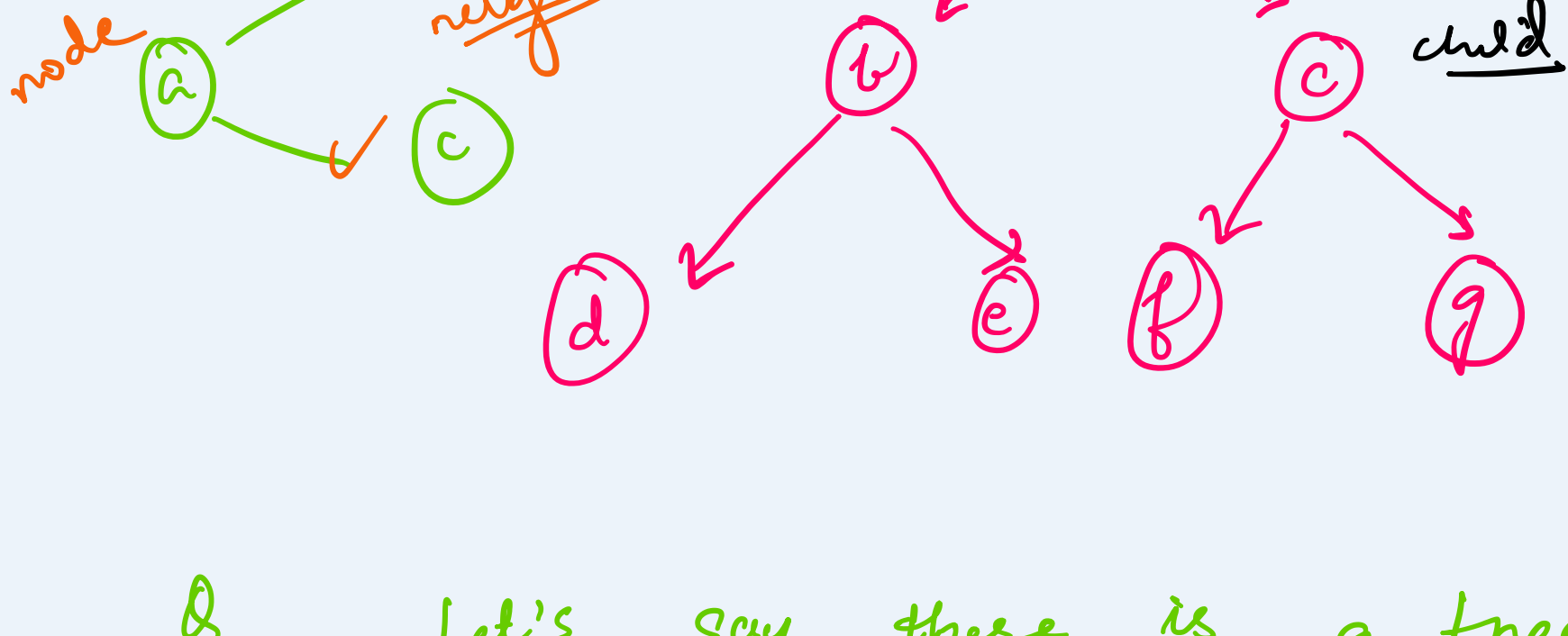


## Complete graph

→ every two vertices are adjacent.

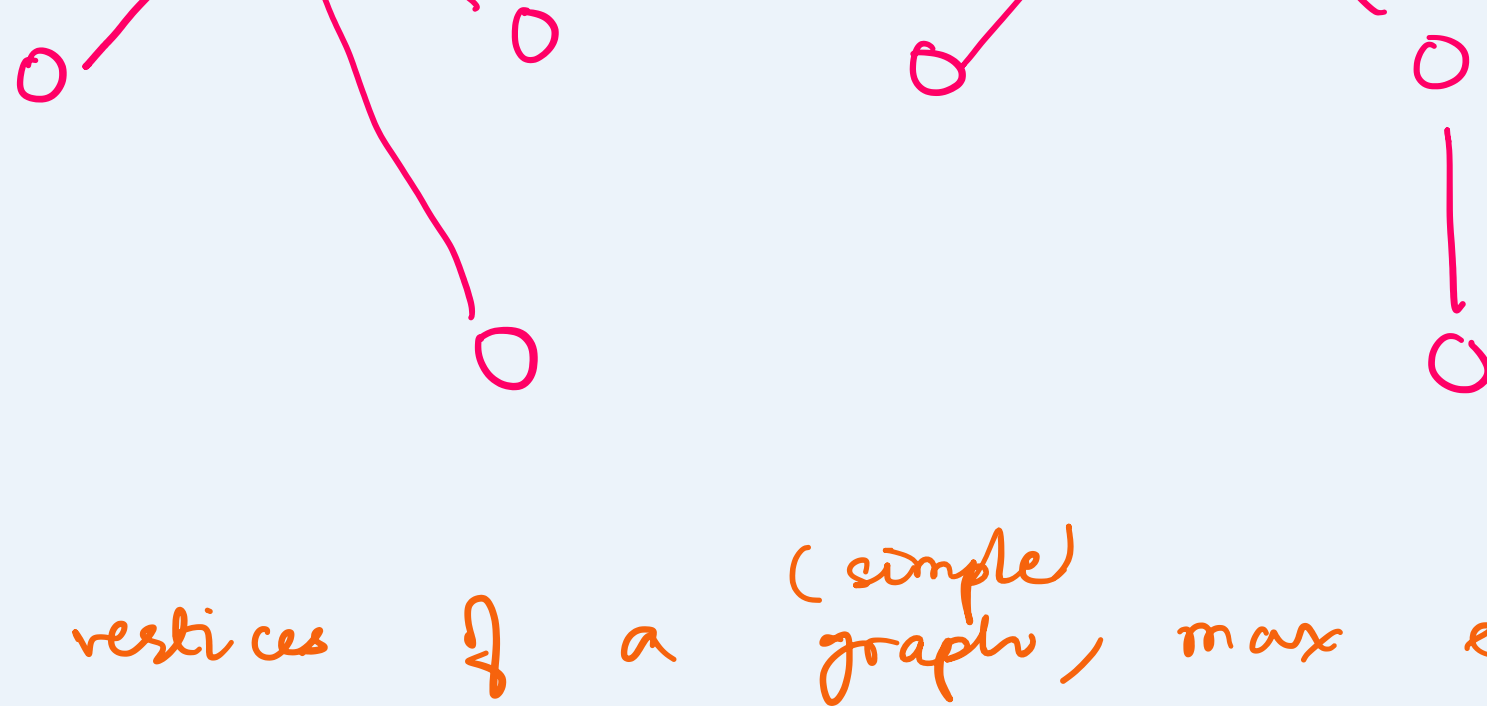


Tree is a special graph with no cycles.



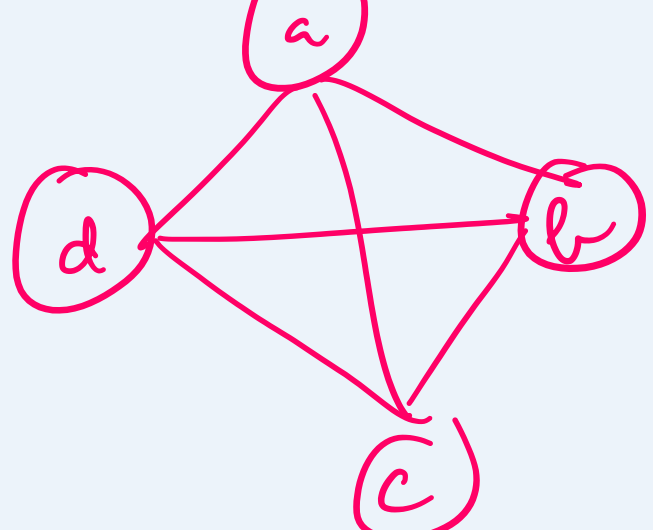
Q. Let's say there is a tree with n nodes, how many edges can be there??

$n-1$



Q. n vertices of a (simple) graph, max edges??

clique



$nC_2$

