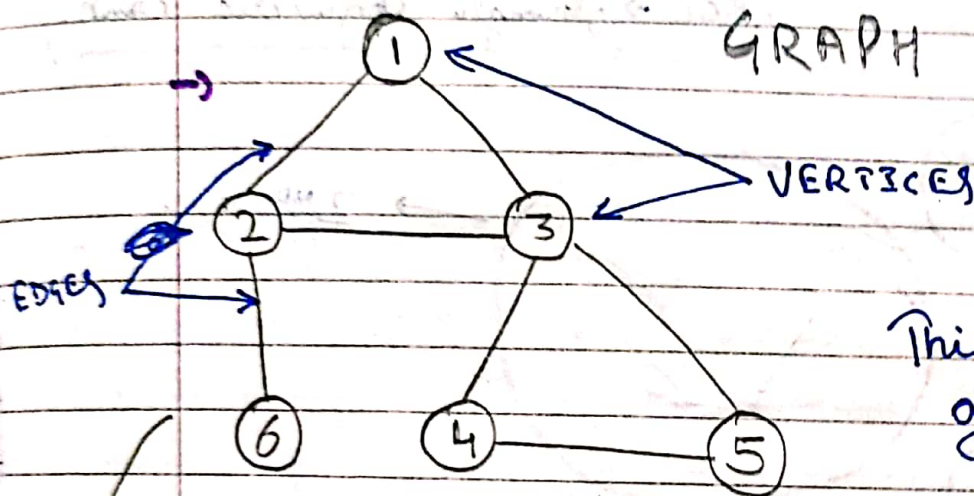


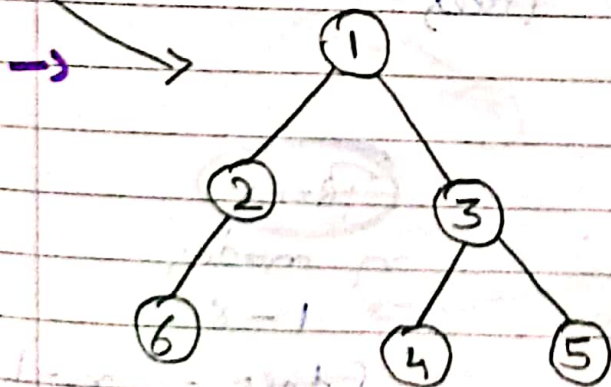
ALL THE TREE / GRAPH TERMINOLOGY

58



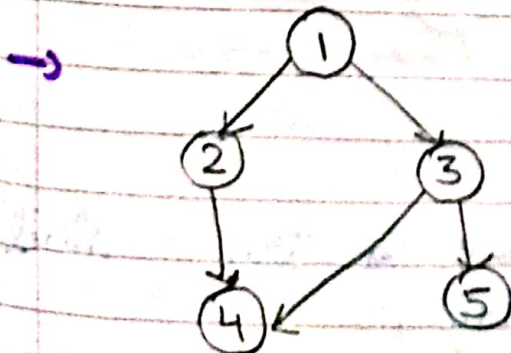
This is an undirected graph.

Here, we can see cycles in $\textcircled{1} \textcircled{2} \textcircled{3}$ and $\textcircled{3} \textcircled{4} \textcircled{5}$.
As soon as we remove those cycles it will ~~be~~ become a Tree.



Removed cycles and now its a Tree.

Trees $\rightarrow n$ nodes
Edges $\rightarrow n - 1$

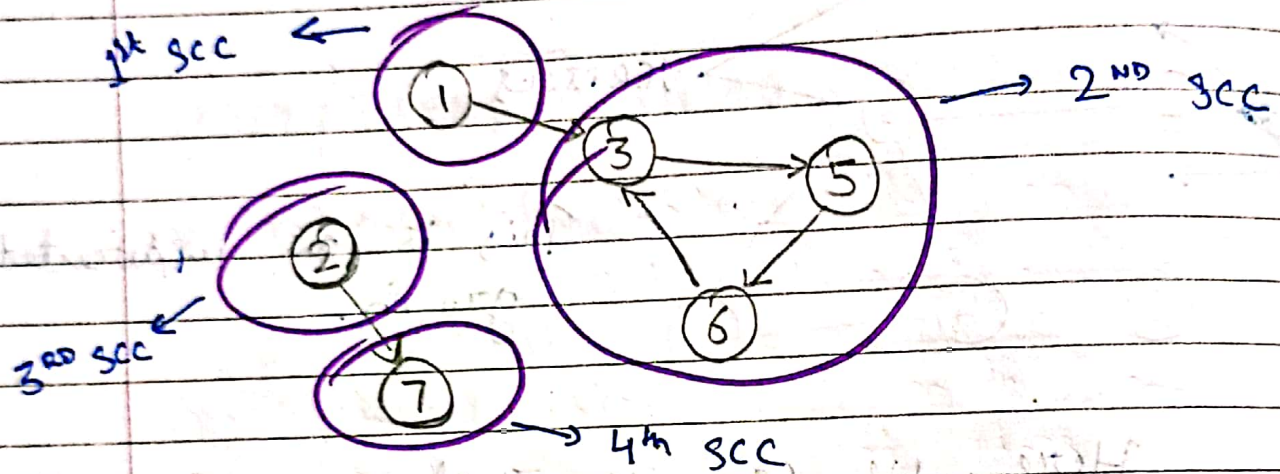


This is a directed graph.
It is Acyclic graph because $\textcircled{1} \textcircled{2} \textcircled{3} \textcircled{4}$ form a cycle, but we can't move in a circle in it.

→ Strongly connected component → 1-lap
ek vertex se har doosere
vertex pe jaana chahiye.

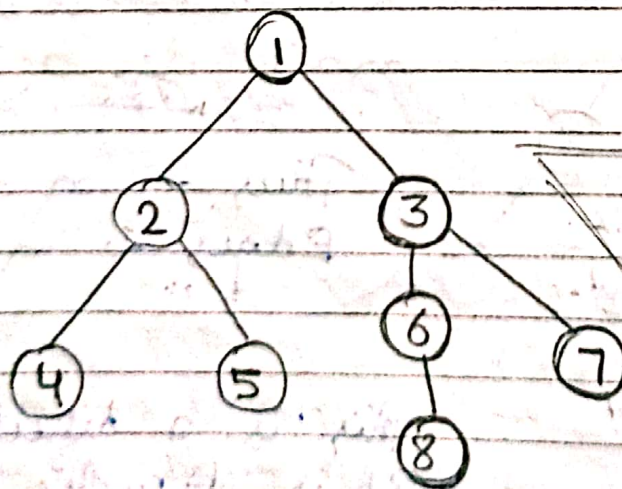
e.g.:

scc → strongly connected comp.



∴ This graph has 4 strongly connected components.

→ Terminologies in Trees:



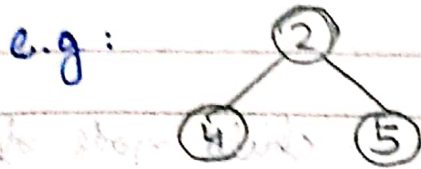
TREE

n nodes

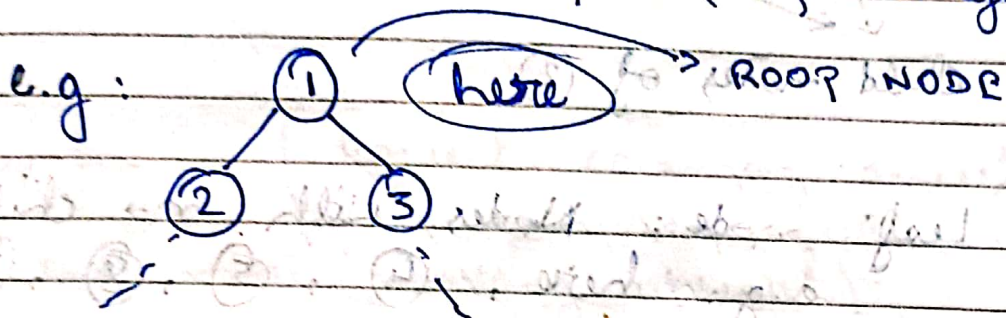
1-8

Edges → $n-1$

1) Subtree: A subset of a tree which will also be a tree.

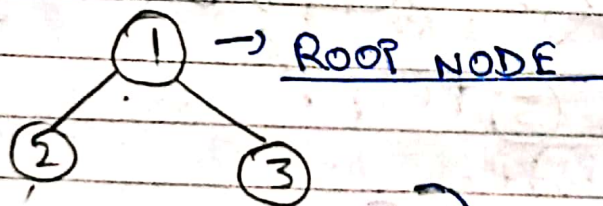


2) Root node : Topmost node from where all other nodes originate.

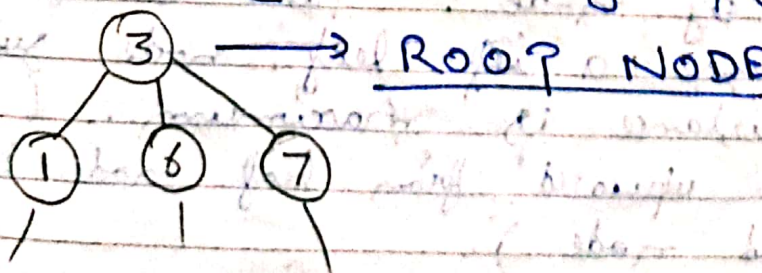


We can imagine it as, if we hang a tree from a node, that node becomes its root node.

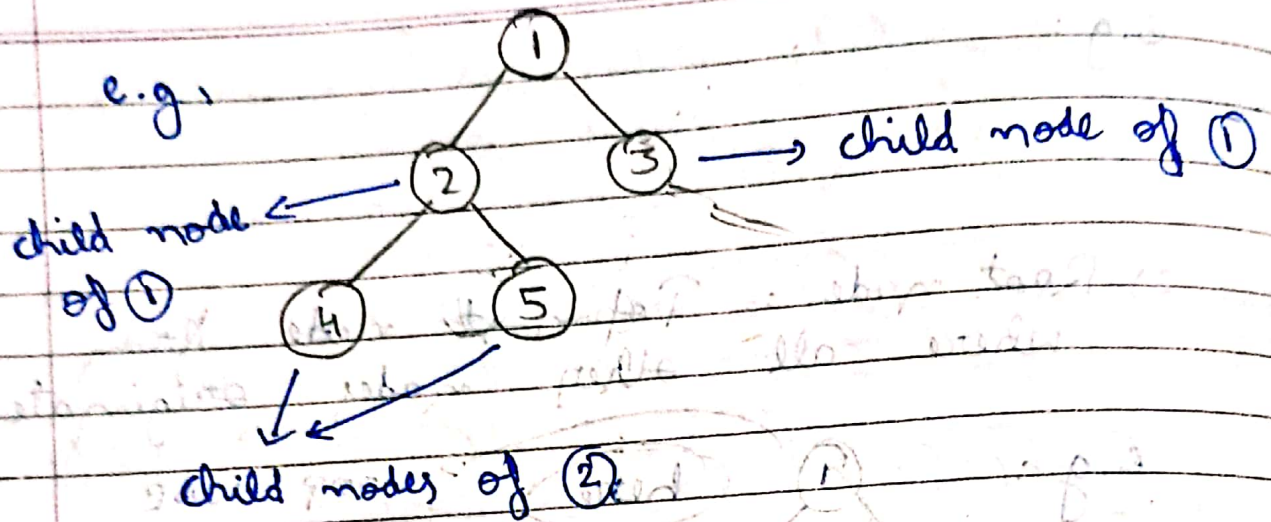
e.g: (Here)



But if we hang it from 3

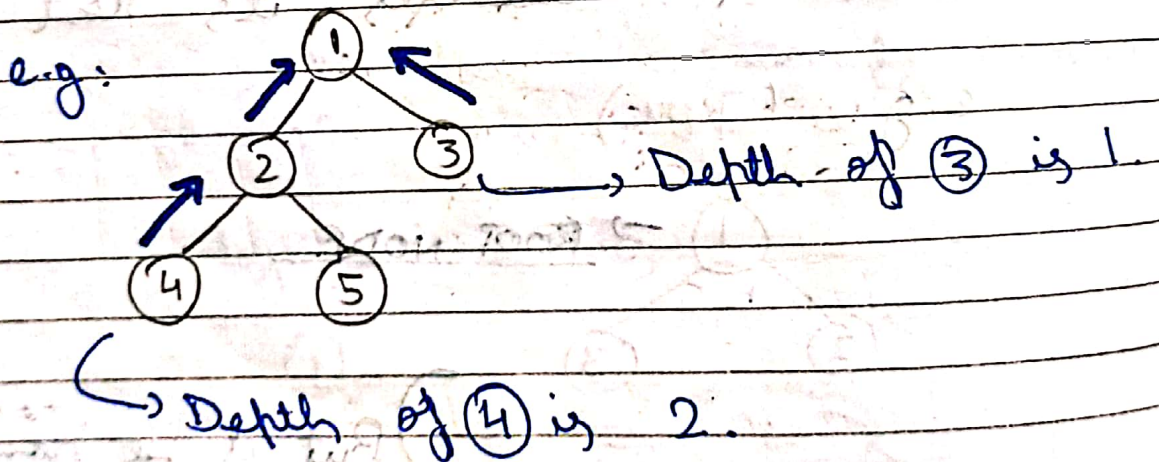


3) Child node : Node which has same root node.



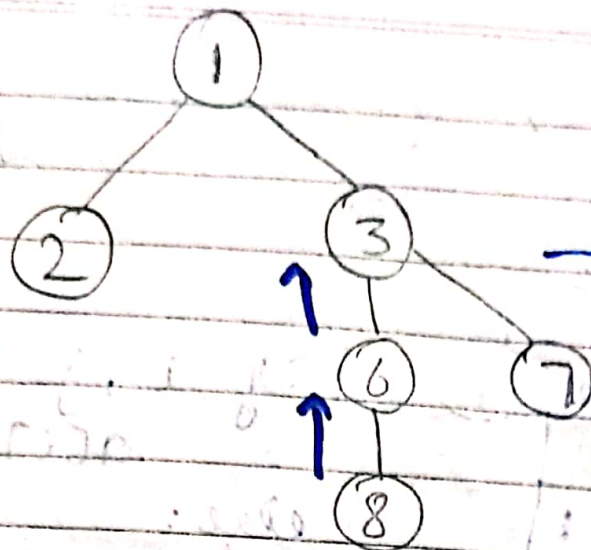
4) Leaf node: Nodes with no child node.
e.g. here, ④, ⑤, ⑧, ⑦.

5) Depth: Distance of node from root node in terms of edges.



6) Height of node: Take a node and choose a leaf node such that their distance is maximum. (only move upward from leaf node to the concerned node).

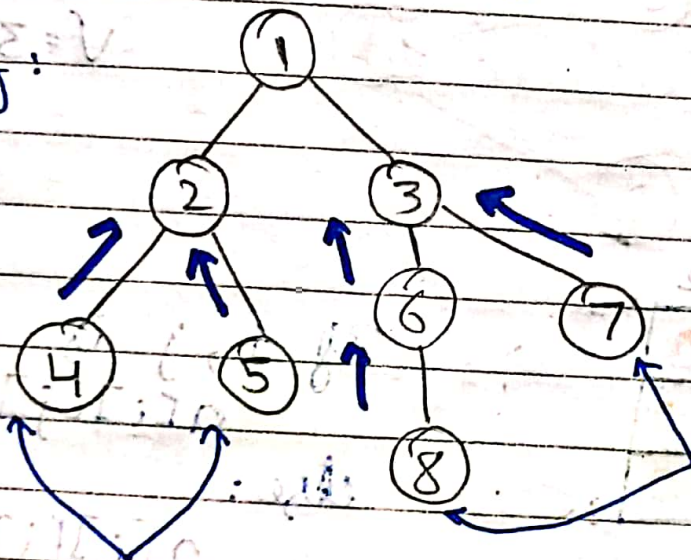
e.g.



→ Height of ③ is 2.

7) LCA (Lowest common ancestor):
Sabse pehla common parent of two nodes (moving upward).

e.g.:



LCA of ④ and ⑤ is ②.

LCA of ⑧ and ⑦ is ③.