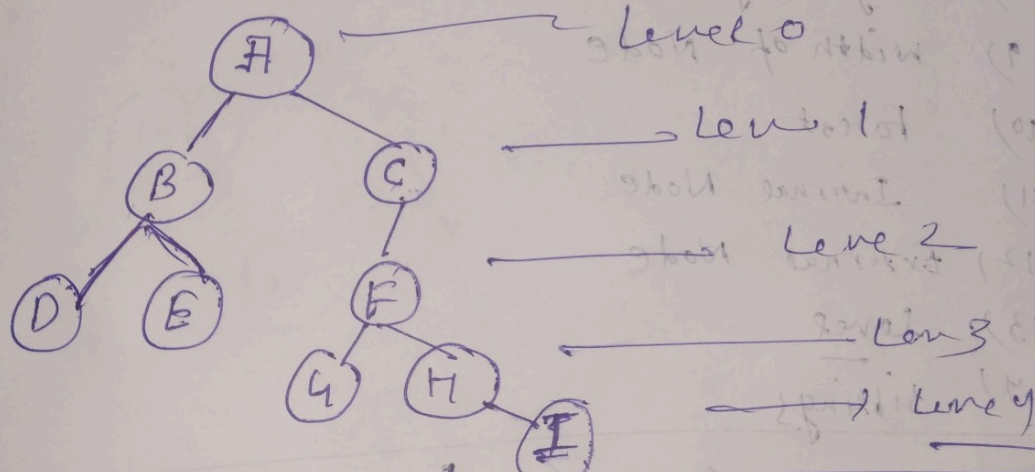
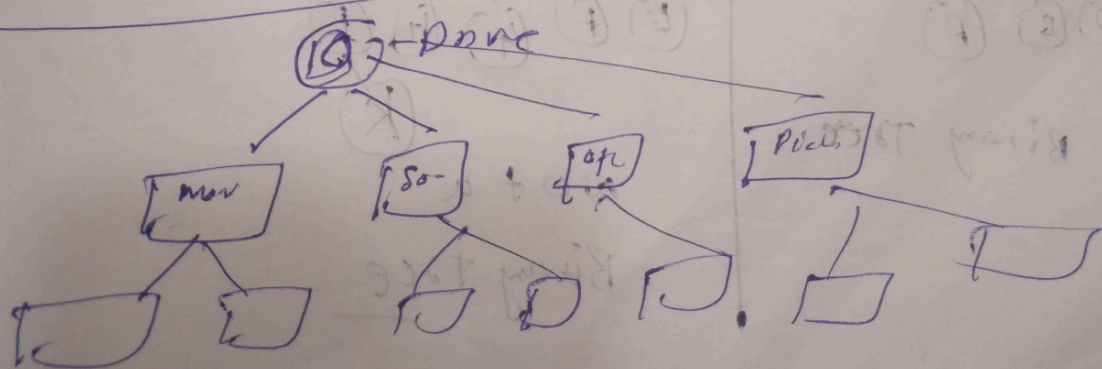


Tree :-

- 1) Tree is a Non Linear type of dynamic data structure
- 2) It represents hierarchical relationship between existing elements
- 3) Insertion and searching is fast in Tree
- 4) It is an advanced data structure

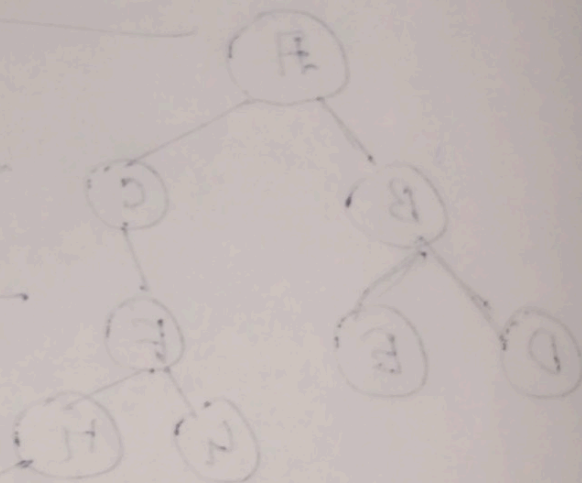


Note :- Real (Natural) Tree grow upwards and tree of Computer Science grow downward

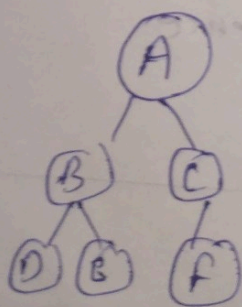


Tree Terminology

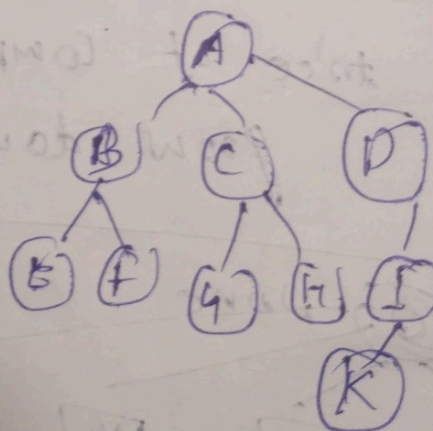
- 1) Root
- 2) Left Subtree
- 3) Right "
- 4) Parent Node
- 5) child Node
- 6) Edge
- 7) height of tree
- 8) height of Node
- 9) width of Node
- 10) Forest
- 11) Internal Node
- 12) External Node
- 13) level
- 14) siblings



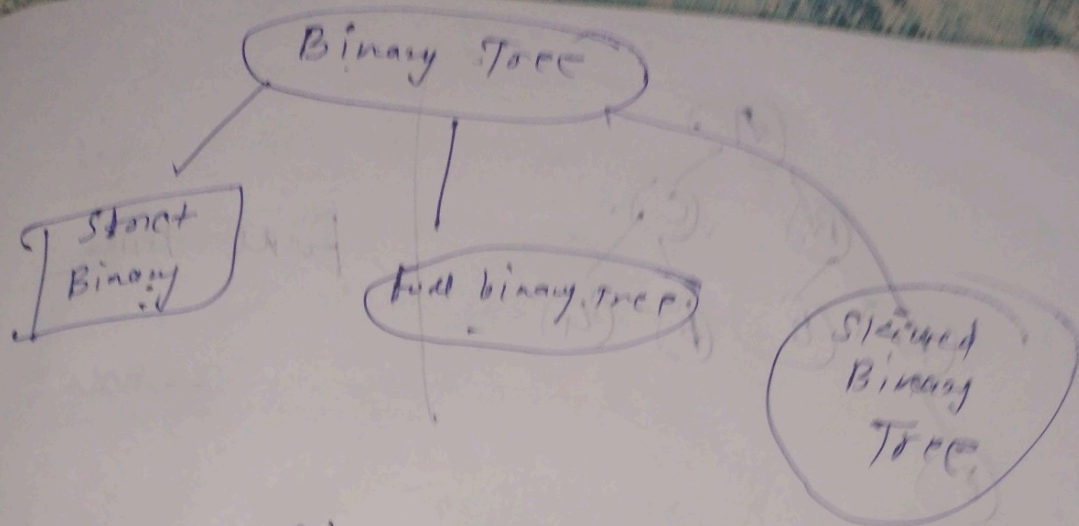
Binary Tree :- At most 2 children



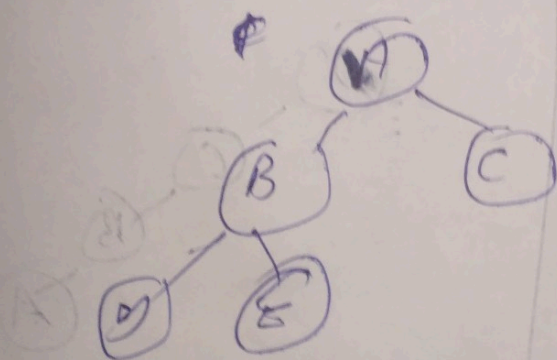
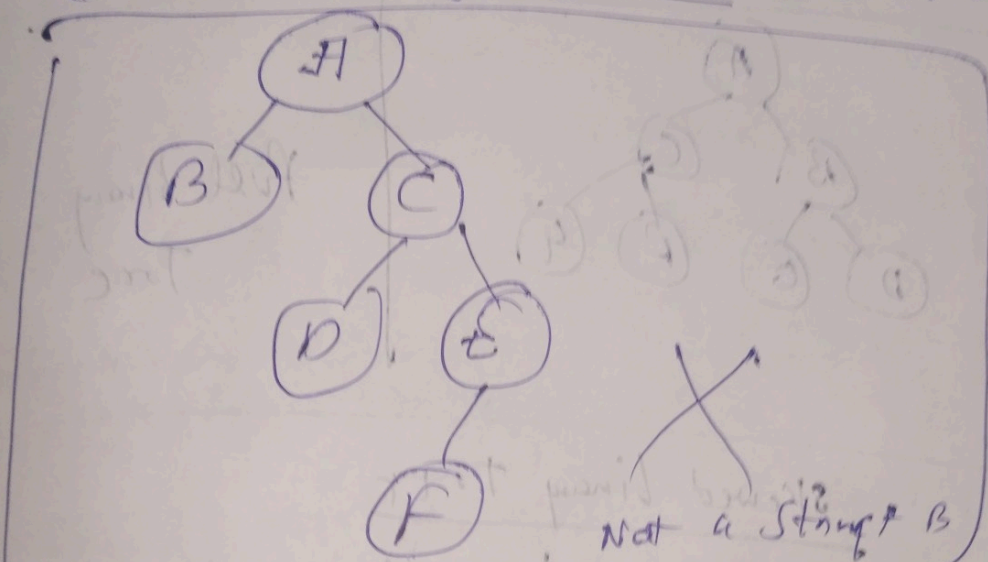
Binary Tree



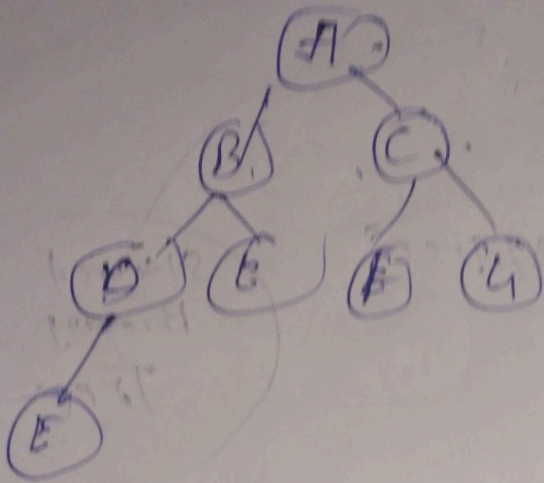
Not a
Binary tree



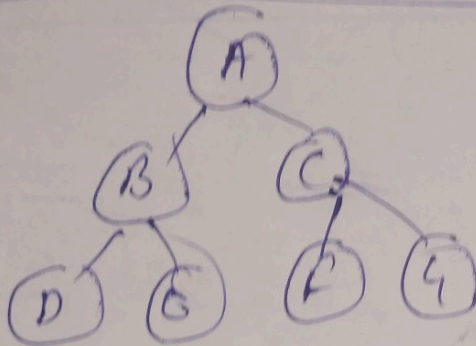
Strict Binary Tree \therefore A 0 or 2 child



Strict Binary Tree



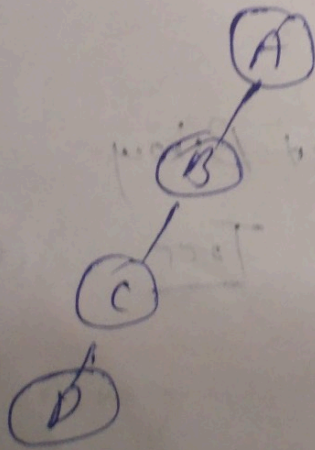
Full Bin^y



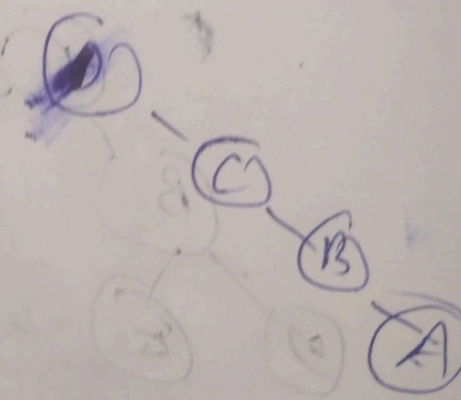
Full binary Tree

Skewed binary tree

Left skewed



Right skewed



Tree Traversal

Level order Traversal

Label wise Traversal

Inorder Traversal

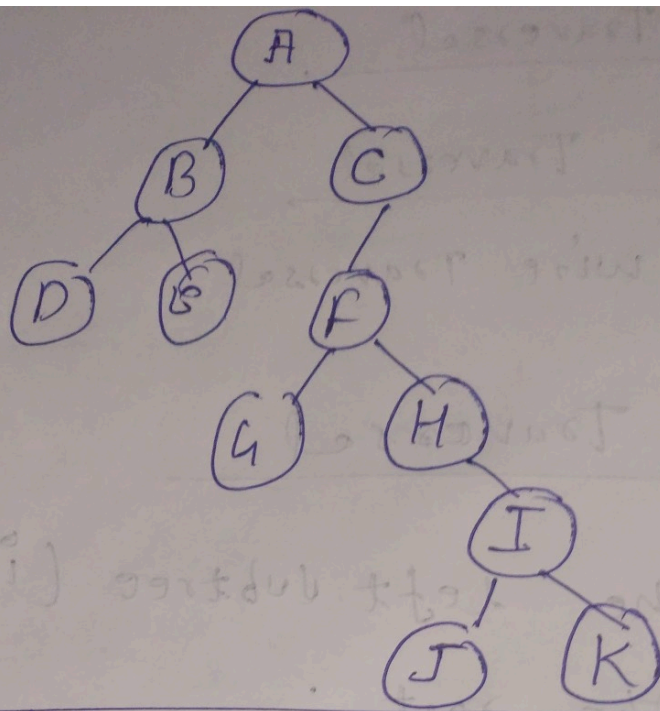
- 1) Visit the left subtree (In Preorder)
- 2) Visit the root.
- 3) Visit the right subtree (In Postorder)

Preorder Traversal

- 1) Visit the root
- 2) Visit the left subtree (In Preorder)
- 3) Visit the right subtree (In Preorder)

Postorder Traversal

- 1) Visit the left subtree (In Postorder)
- 2) Visit the right subtree (In Postorder)
- 3) Visit the root



Level order

A, B, C, D, E, F, G, H, I, J, K

InOrder

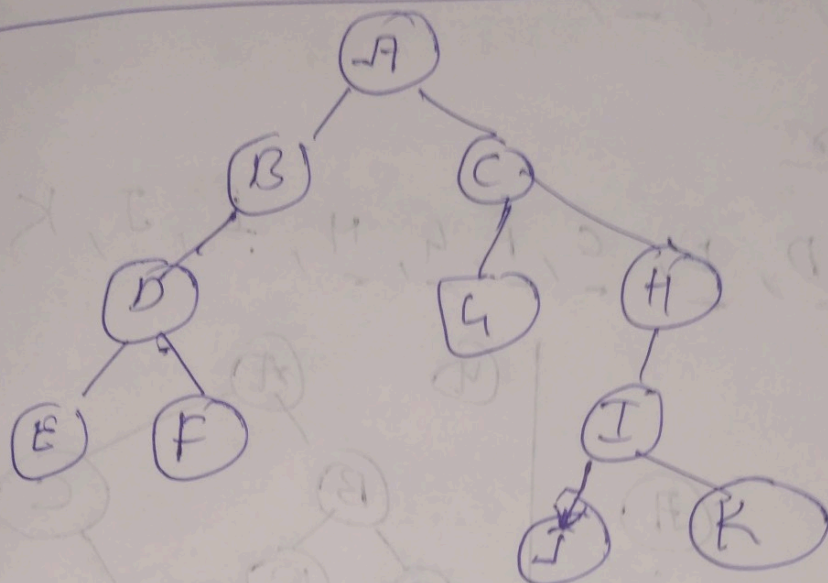
D, B, E, A, G, F, H, J, I, K, C

Preorder

A, B, D, E, C, F, G, H, I, J, K

Postorder

D, E, B, G, J, K, I, H, F, C,
A



Inorder

E, D, F, B, A, G, C,
J, I, K, H

preorder

A, B, D, E, F,
C, G, H, I, J, K

Postorder

E, F, D, B, G, J, K, I,
H, C, A

Construct a Tree with
following values in traversal

Inorder

D, B, E, A, G, F, H, J, I, K, C

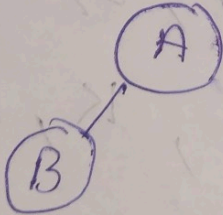
Preorder

A, B, D, E, C, F, G, H, I, J, K

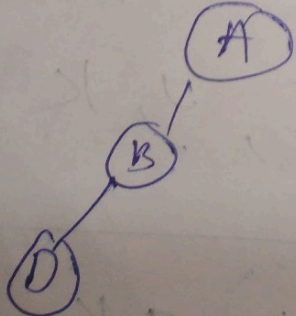
①

A

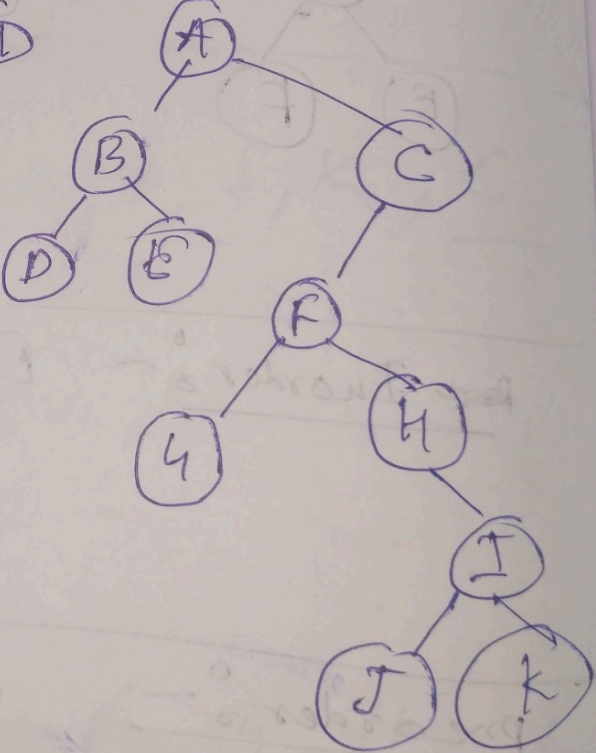
②



③



④

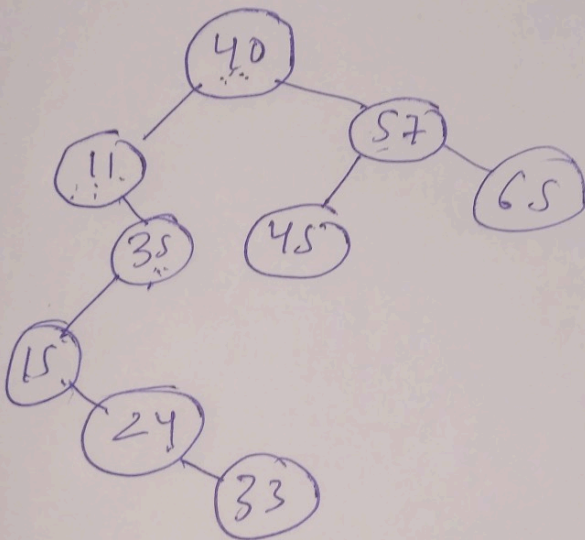


Binary Search Tree (BST)

make a BST with following values

40, 11, 57, 45, 35, 65, 15, 24,
33

①



make a BST with following values

M, P, E, O, P, Q

