Youtube : URL

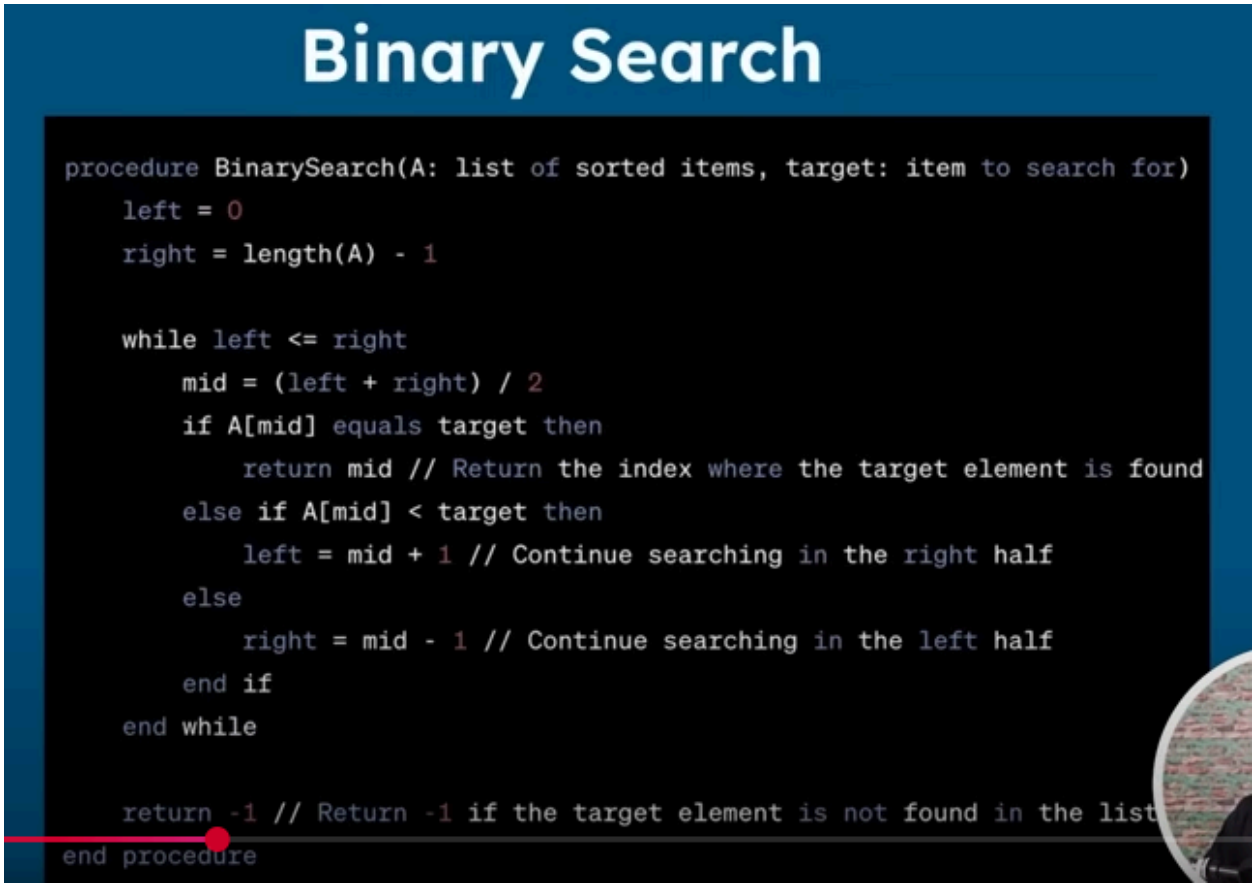
- Storing the efficiently :DS is a way to store data efficiently.
- Efficiency means : Performance and memory
- What is Algorithm:- Set of instructions

When to use what.First understand what those are.

ADT (ABSTRACT DATA TYPE)

- ROUGH NOTE : Data Collection , Data Processing , Data output and Data Storage
  - Complete Java, Spring, and Microservices course
- Object in OOPS and Structure in C

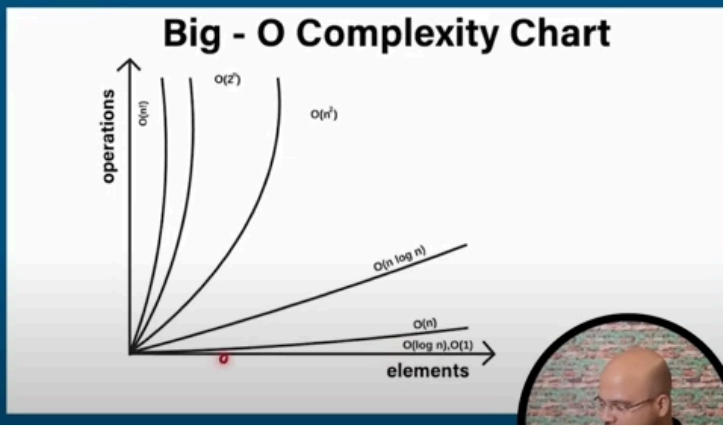
Binary Search



Big 0 notation

Big O Notation

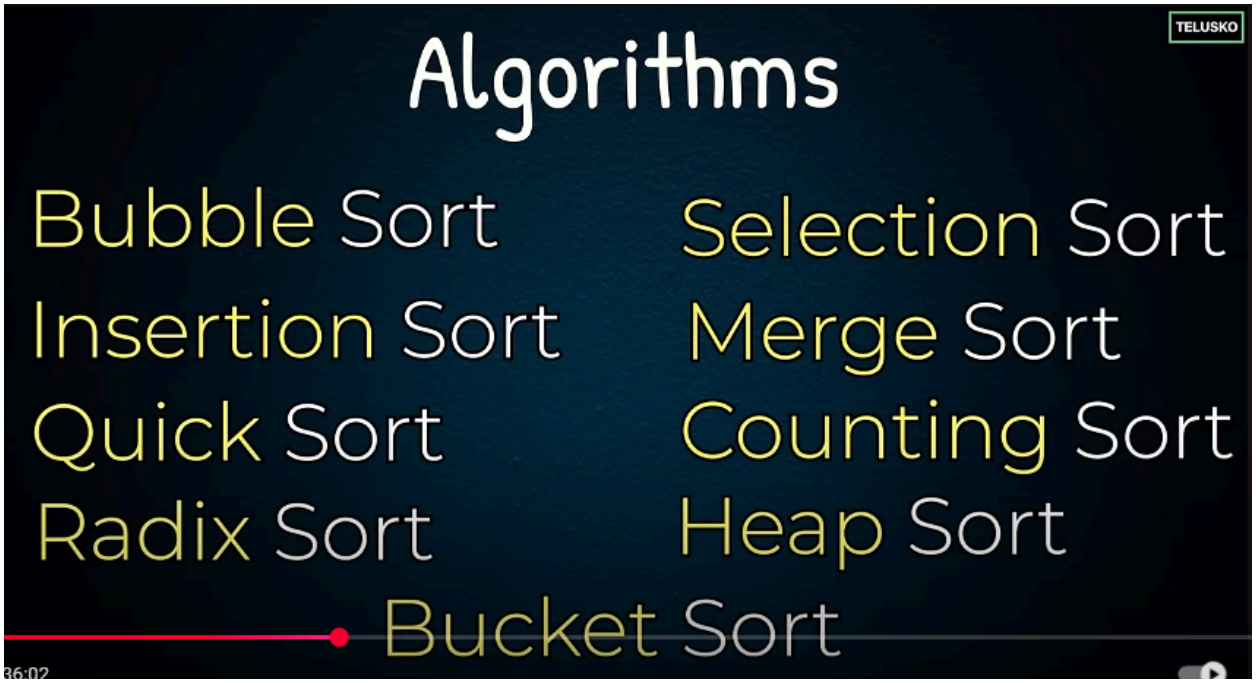
- O(1) : Constant Time
- O(log n) : Logarithmic Time
- O(n) : Linear Time
- O(n log n) : Linearithmic Time
- $O(n^2)$: Quadratic Time
- $O(2^n)$: Exponential Time
- O(n!) : Factorial Time



Time Complexity

measure of how the running time of an algorithm increases with the size of the input data

Sorting



Time complexity is O(n2) for **bubble sort** and **Selection sort**;

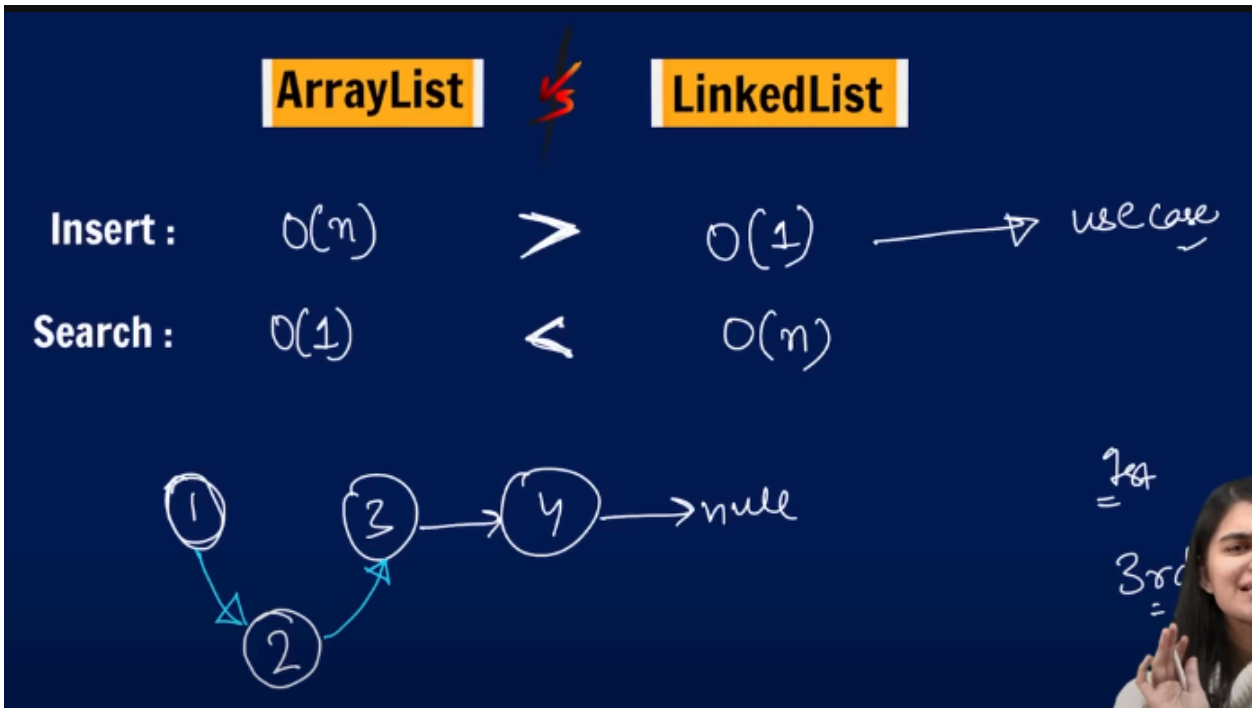
QUICK SORT -> O(nlogn)

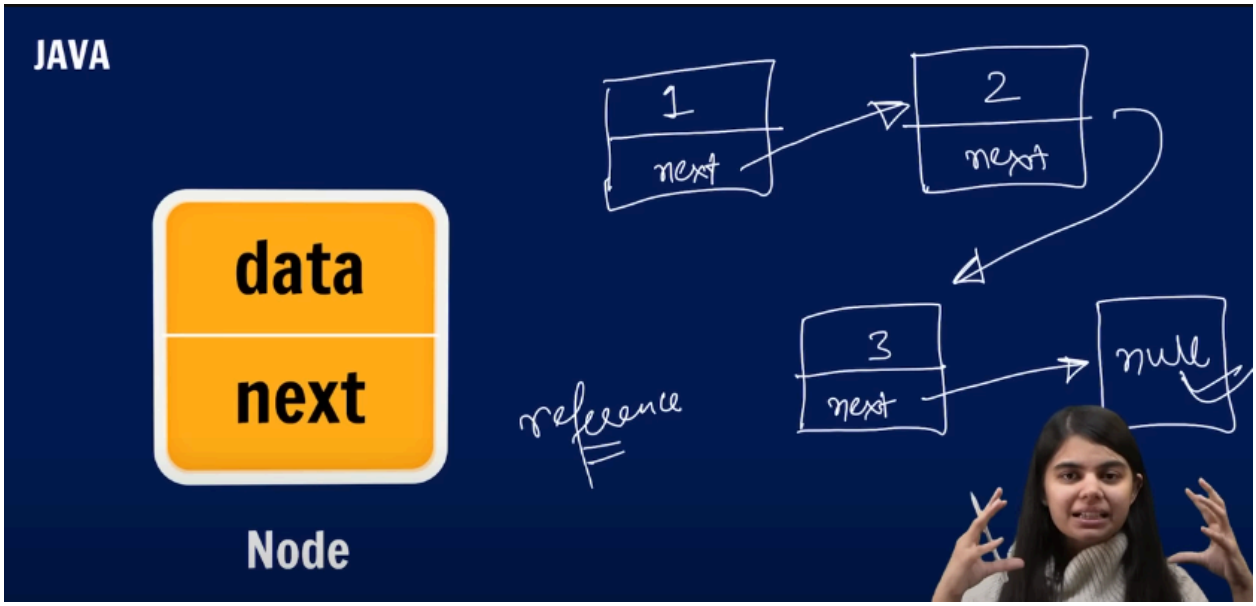
Recursion

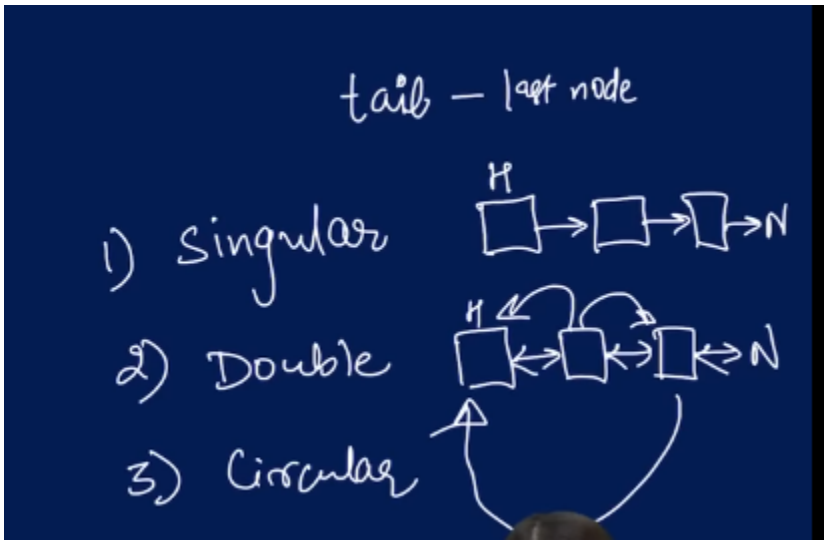
MERGE SORT

Linked List

- No Contigues

- 
ArrayList
vs
LinkedList
Insert : O(n) > O(1) → use case
Search : O(1) < O(n)
1
2
3
4
null
- 
Linked List
Variable Size
Non-contiguous Memory
Insert in O(1)
Search in O(n)

- 

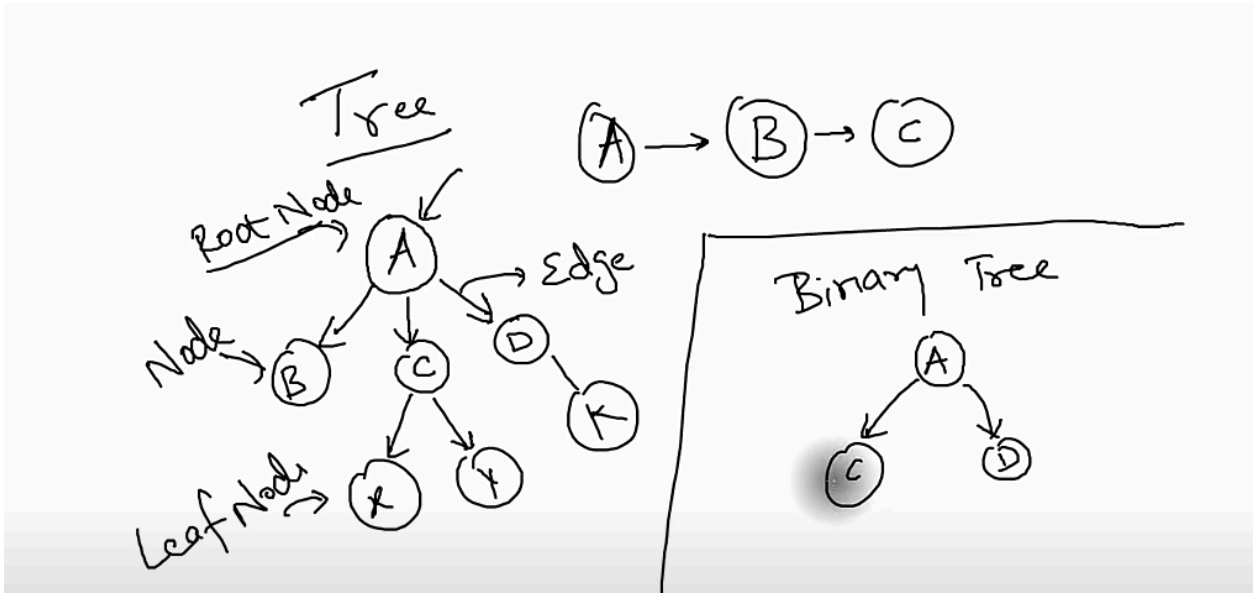
- 

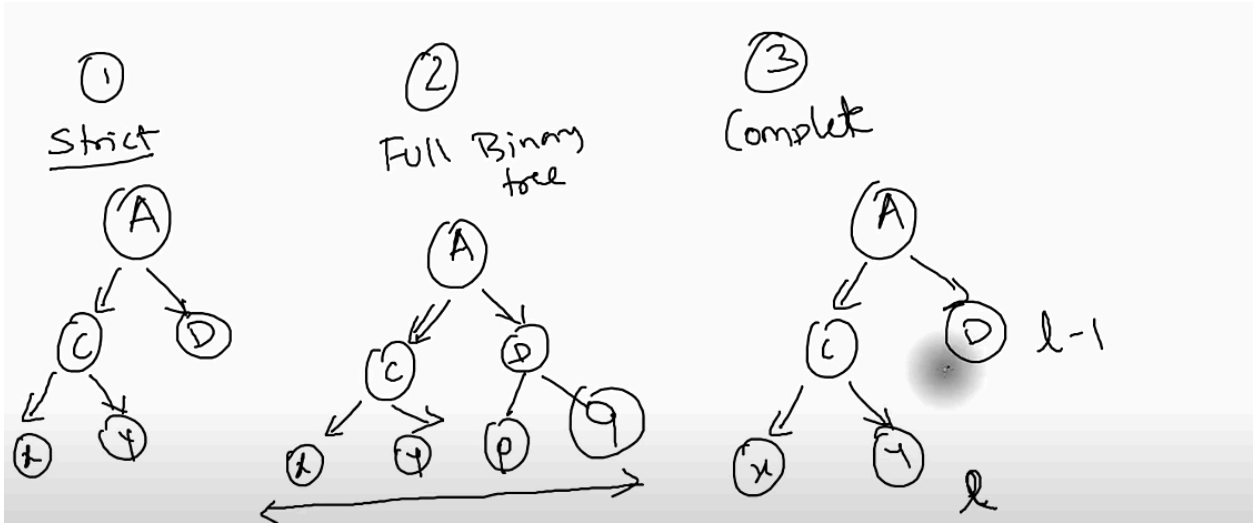
Stack

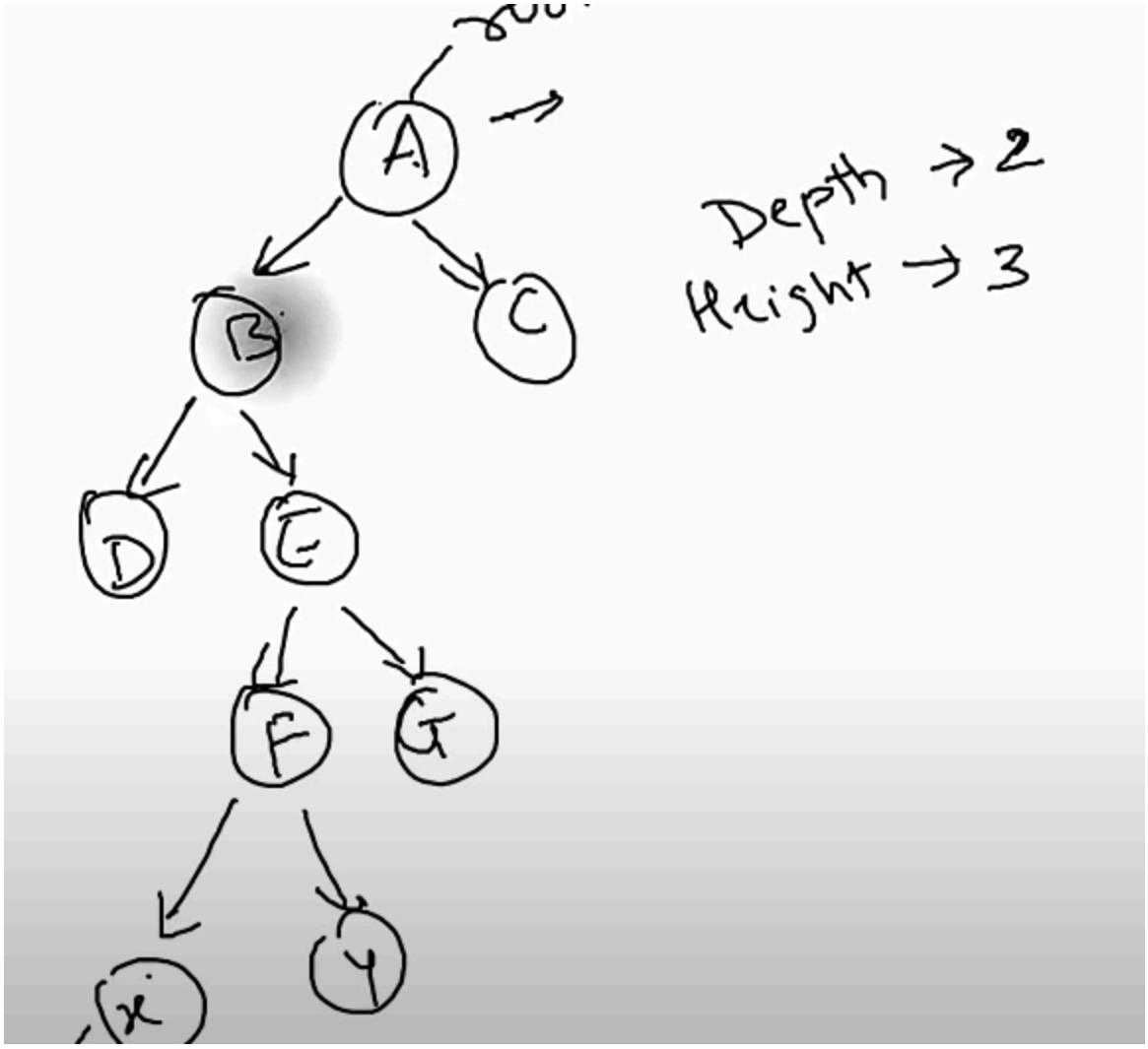
- LIFO (last in first out)

QUEUE

Tree


Tree
A → B → C
Root Node
A
Edge
Node
B
C
D
K
Leaf Node
X
Y
Binary Tree
A
C
D

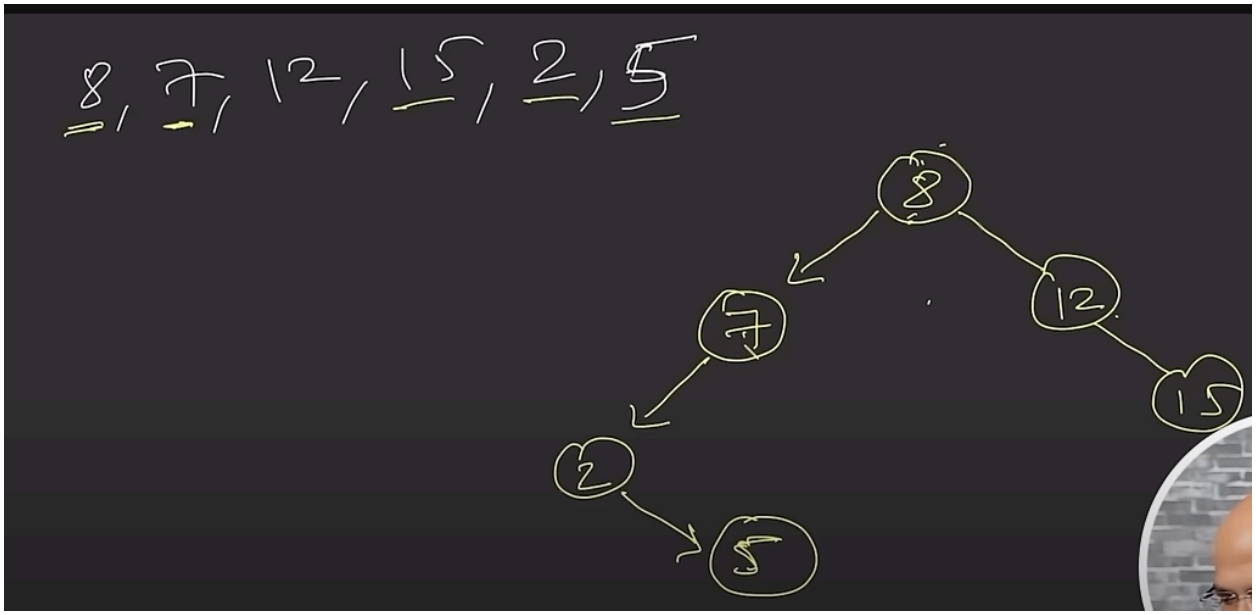

1
Strict
A
C
D
X
Y
2
Full Binary tree
A
C
D
X
Y
P
Q
3
Complet
A
C
D
l-1
X
Y
l



Height/Depth of E

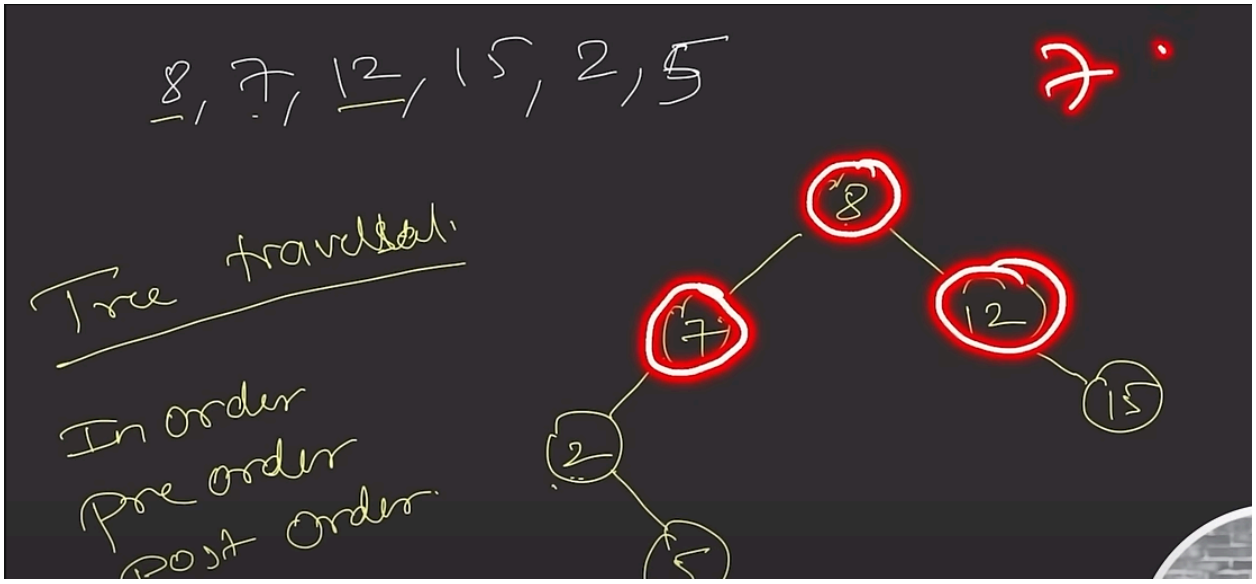
- Height of tree is equal to height of root node

Binary Search tree



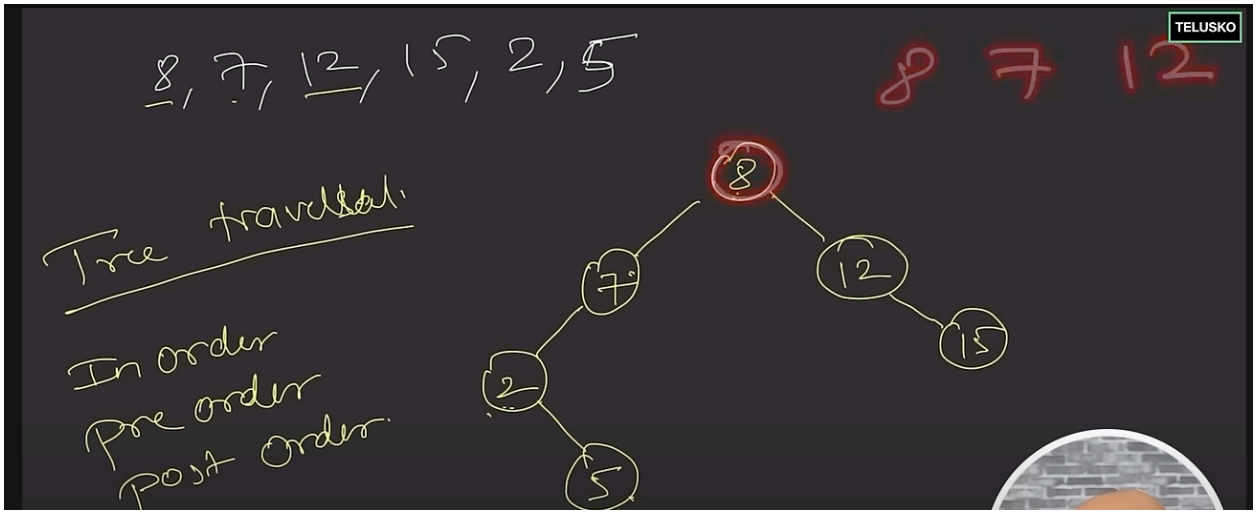
Inorder traversal

7 -> 8 -> 12



Pre-order traversal

8 -> 7 -> 12



Post-order Traversal

7 -> 12 -> 8