* Basic Analysis on Algorithm :-

Analysis of algorithms is the determination of the amount of time and space resources to execute it.

The analysis of algorethm is to compare the various algorethms to solve a same problem.

This is done to analyse which algorethm takes less resowrces such as time, effort and memory to solve a particular problem.
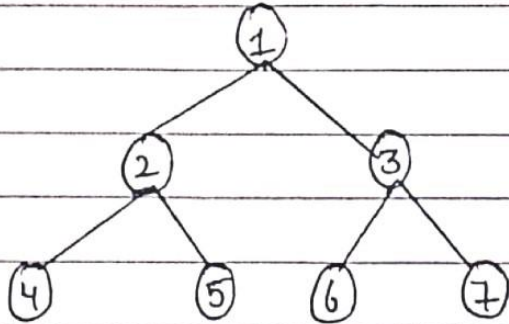
Types of analysis of algorethm :-

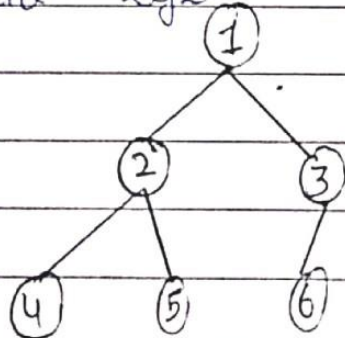1. Best case

2. Worst Case

3. Average Case.

To analyze a particular algorethm, we need to understand for which input the algo takes less time or which I/p takes more
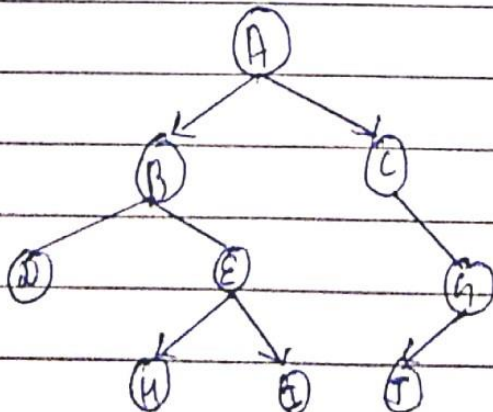
② Perfect Binary Tree :-

A tree is a Perfect Binary tree if all the internal nodes have 2 children, and all the leaf node are at the same level.
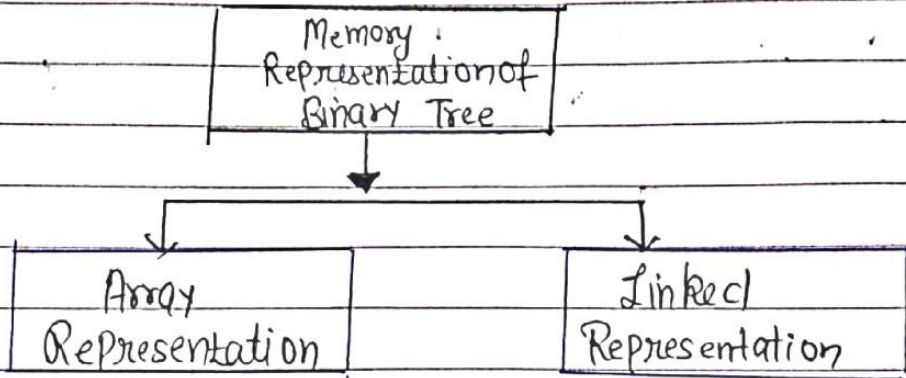
```
            (1)
           /   \
         (2)    (3)
        /  \    /  \
      (4)  (5) (6)  (7)
```

③ Complete Binary Tree :- In which all the levels are completely filled except possibly the lowest one, which is filled from the left.

```
            (1)
           /   \
         (2)    (3)
        /  \    /
      (4)  (5) (6)
```
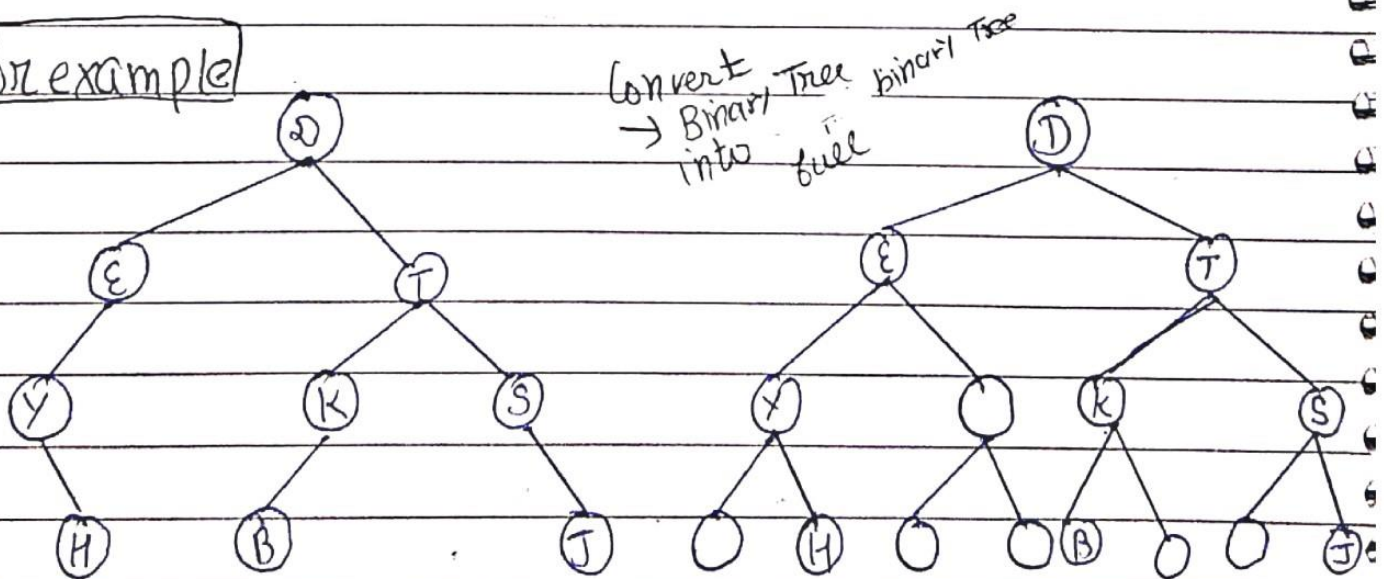
④ Neither full nor Complete :-

```
            (A)
           ↙   ↘
         (B)    (C)
        /  \      \
      (D)  (E)    (G)
          ↙  ↘   ↙
        (H)  (I) (J)
```

* Representation of Binary Tree in Memory :-

```
        ┌─────────────────┐
        │     Memory      │
        │ Representation of│
        │   Binary Tree   │
        └────────┬────────┘
                 │
         ┌───────┴───────┐
         ▼               ▼
  ┌─────────────┐  ┌──────────────┐
  │    Array    │  │   Linked     │
  │Representation│  │Representation │
  └─────────────┘  └──────────────┘
```
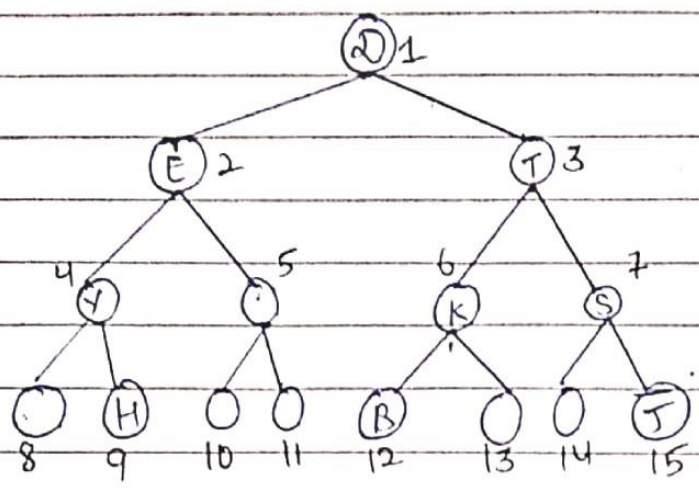
1. Array Representation of Binary Tree :-

→ To represent a binary Tree using array first we need ———— to convert a binary Tree into a full binary Tree. and then we give the number to each node and store it into their respective location.
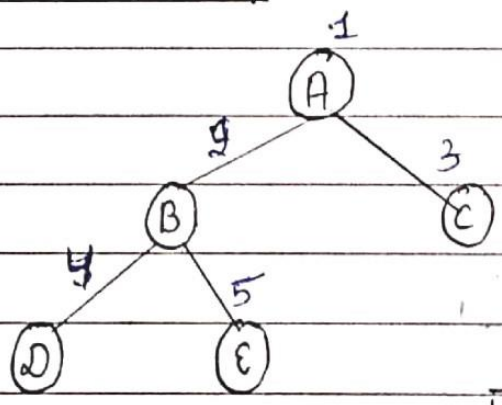
for example

Convert Tree binary Tree
→ Binary Tree into full

→ So, now the tree becomes a full Binary Tree, we need to give the numbers to each and every node but level by level.

tree

	D	E	T	Y		k	S		H			B			J
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Example 2

1	A
2	B
3	C
4	D
5	E

Array tree

② Linked List Representation :-

- A binary tree can also be represented by linked list.

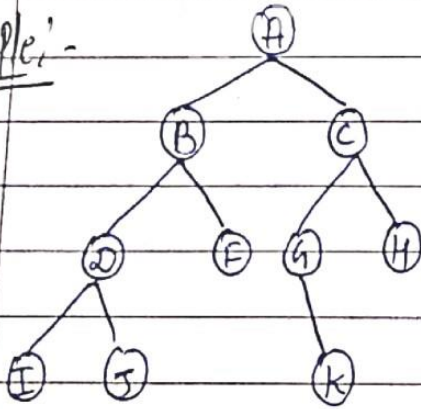- It is represented by a structure having three fields.

  1. Data :- It Stores the information (basic data)
  2. Left :- It points to the left child of the node.
  3. Right :- It points to the right child of the node.

left	data	Right

Example :-

Linked List representation :-