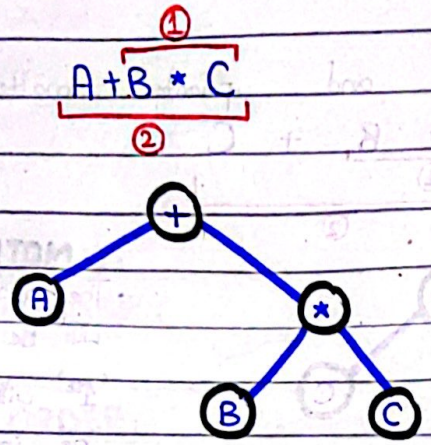
EXAMPLE: A + B * C



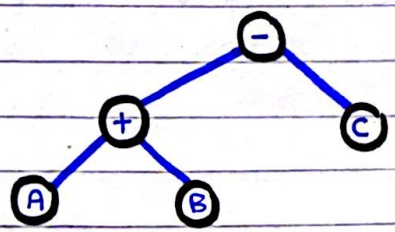
IN-ORDER: A + B * C (In fix Expr)

PRE-ORDER: + A * BC (Prefix Expr)

POST-ORDER: A BC * + (Postfix Exp)

EXAMPLE: A + B - C

A + B - C
→ (1) (2)



- As '+' and '-' are of same priority so, we see precedence by moving from left to right.

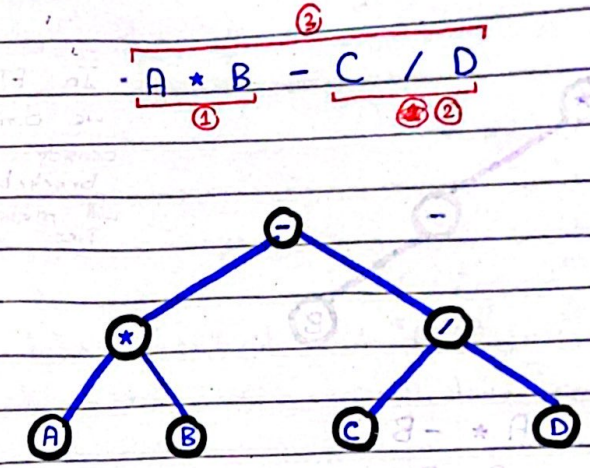
So, '+' will be somewhere lower in the tree

IN-ORDER: A + B - C

PRE-ORDER: - + ABC

POST-ORDER: AB + C -

EXAMPLE: A * B - C / D



- As * and / have same priority so, we take precedence left to right.

  * → 1st
  / → 2nd

IN-ORDER: A * B - C / D

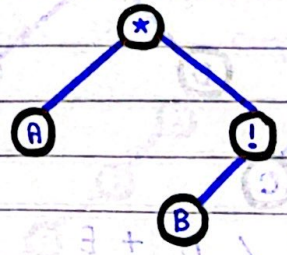
PRE-ORDER: - * AB / CD

POST-ORDER: AB * CD / -

EXAMPLE:

A * B!

So, we adjust it accordingly And also remember that operand don't have any child.



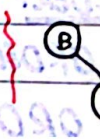
IN-ORDER: A * B! **POST ORDER:** A B ! *

PRE-ORDER: * A ! B

* As '!' is a unary operator. S we use it accordi

NOTE: When

do In-Order Traver the resultant we get will be necessarily same the original questio (expression).

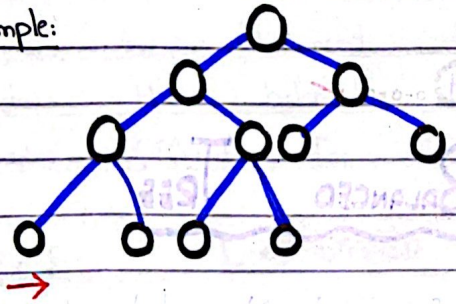


HEAP DATA STRUCTURE

* It is a Binay Tree.
* But It is a Complete Binay Tree.

↳ • Every level is complete except possibly the last level and last level usually fill from left side.

Example:



Complete binay Tree.

* A heap is a special Tree - based data structure in which the tree is a "COMPLETE BINARY TREE."

Generally, Heaps can be of two types:

1) MAX HEAP

2) MIN HEAP

1) MAX HEAP:

• In a Max - Heap the key/value present at the root node must be greater among the keys present at all of it's children.

• The same property must be recursively bue for all sub-trees in that Binay Tree.

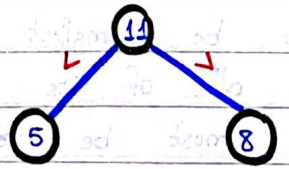
• So, In root we have always the "LARGEST VALUE."

• So, to get largest value in max he the time taken is O(1).

EXAMPLES:

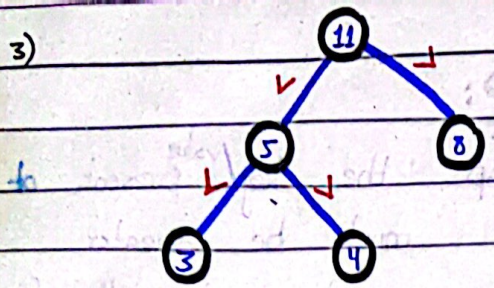
1) 

✓ → Max Heap

2) 

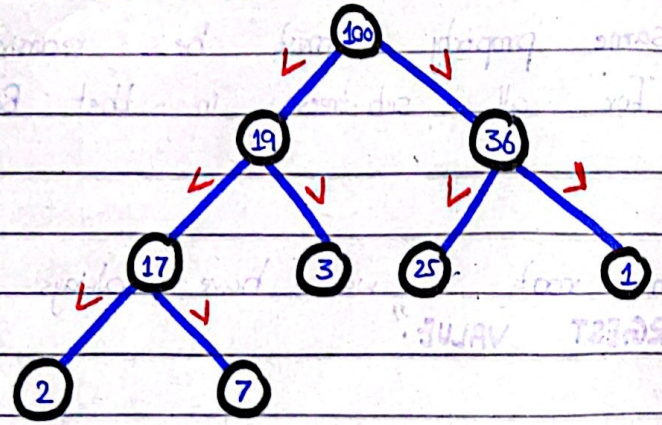
✓ → Max Heap

3)



✓ → max Heap

4)



✓ → max Heap

2) MIN HEAP:

* In a Min Heap the value present at the root must be smallest among the keys present at all of its children. The same property must be recursively true for all sub-trees in that Binary tree.

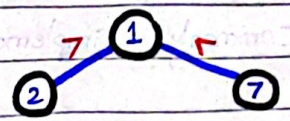
* So, in root we have always the "SMALLEST VALUE"

EXAMPLE:

1)

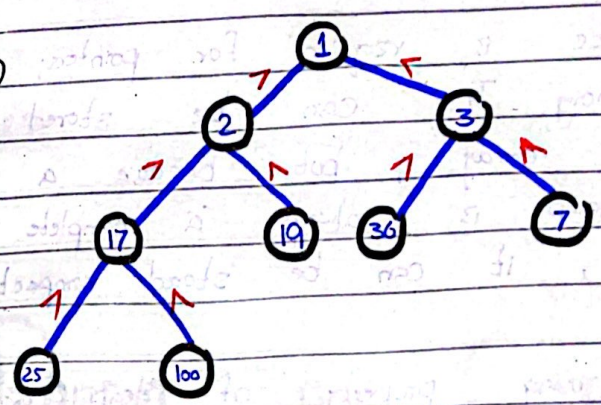
✓ → Min Heap

2)



✓ → Min Heap

3)



✓ → Min He

NOTE:

Always ~~remb~~ remember for max heap or min heap first we have to check if the tree is a complete Binary Tree **(HEAP)**?