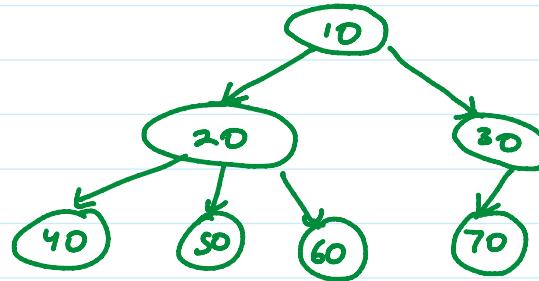


Trees

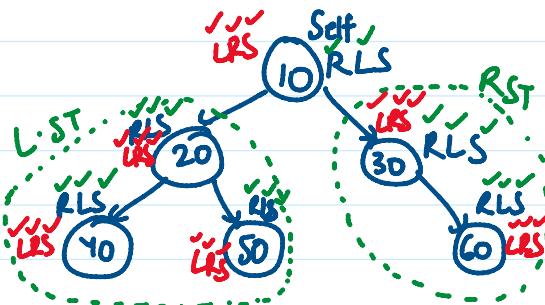
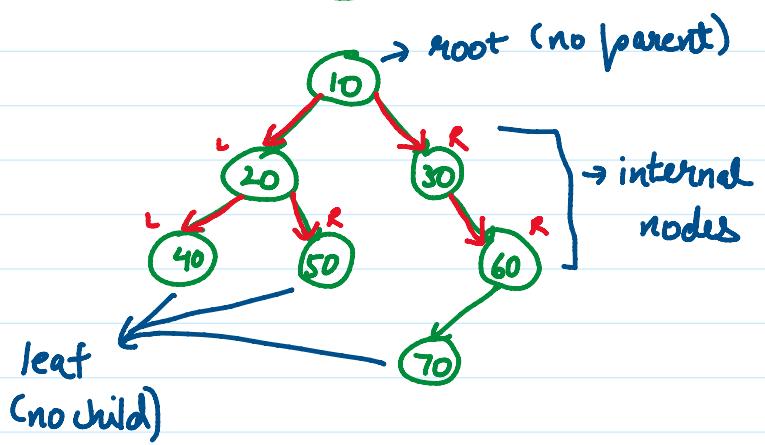
1) Generic Trees

Every node can have multiple children



2) Binary Tree

Every node can have at-most 2 children



display() {

}

RLS : 60, 30, 50, 40, 20, 10

```

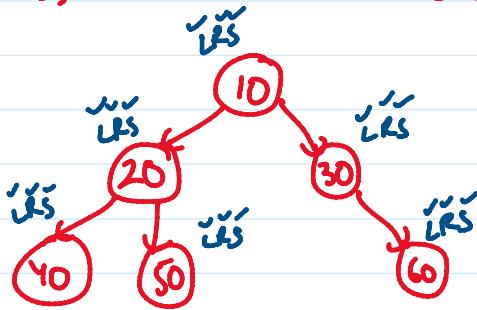
private void disp(Node node) {
    if (node == null) {
        return;
    }
    disp(node.left);
    disp(node.right);
    System.out.println(node.data);
}
  
```

LRS: 40, 50, 20, 60, 30, 10

3: Traversal

- 1) SLR : Preorder
- 2) LSR : Inorder
- 3) LRS : Postorder

RLS → Reverse Preorder
 RSL → Reverse Inorder
 SRL → Reverse Postorder



Preorder: 10, 20, 40, 50, 30, 60

Inorder: 40, 20, 50, 10, 30, 60

Postorder: 40, 50, 20, 60, 30, 10

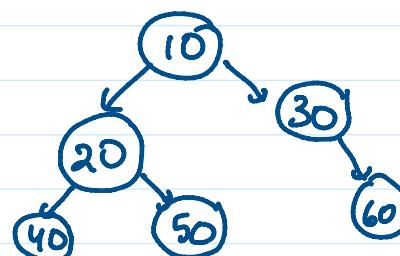
Preorder: 10, 20, 40, 50, 30, 60
 LST RST

SLR

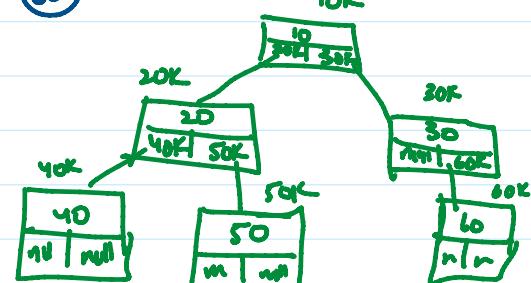
Inorder: 40, 20, 50, 10, 30, 60

LSR

P : 20, 40, 50
 I : 40, 20, 50



P : 30, 60
 I : 30, 60



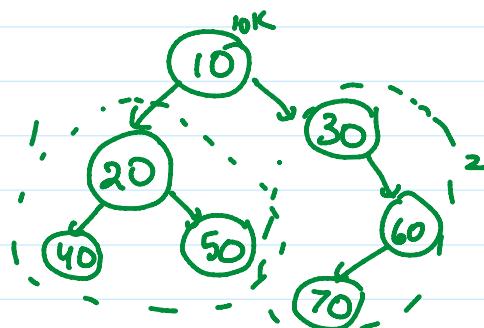
Hw: ① Postorder
 Inorder

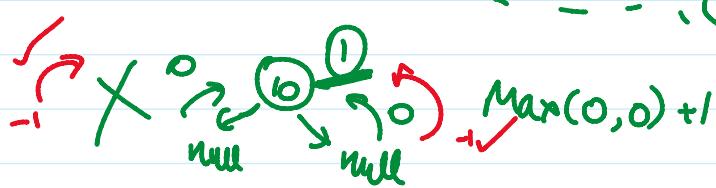
② Preorder, Inorder, Postorder

Ht:

↳ Maximum Distance
 from Root

1 - . - . - ①



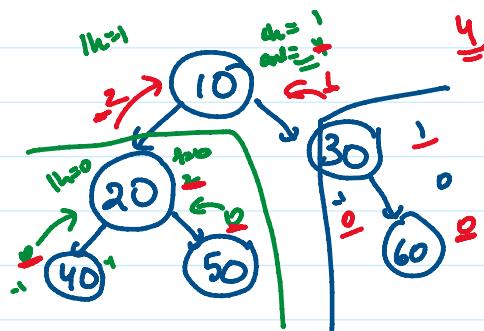
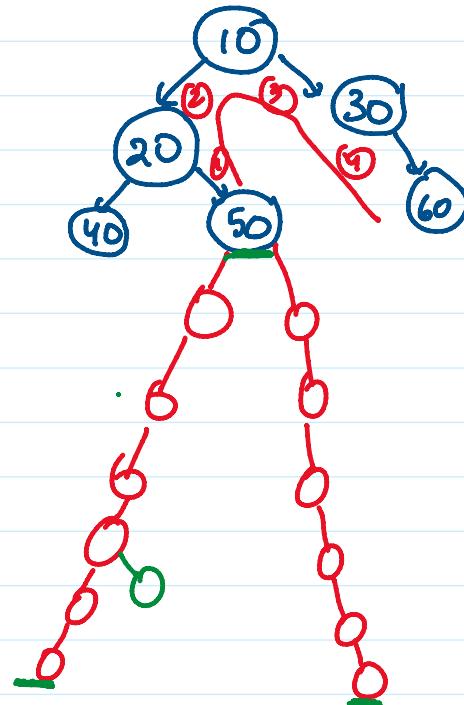


3

Diameter

↳ Maximum Distance
between 2 leaf
nodes

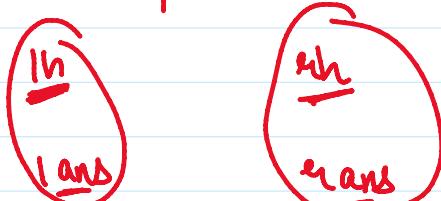
- 1) Root hmesha include hogya?
- 2) Requirements
Left , Right Ht ✓ +2



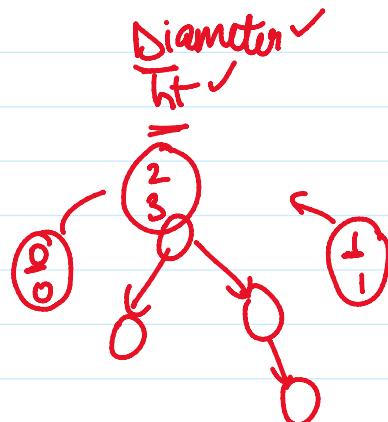
Complexity ??

N

$$N^2 \rightarrow N$$



10



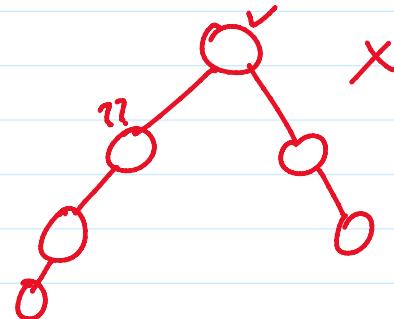
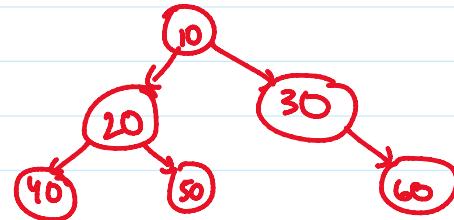
→ : balanced :-)

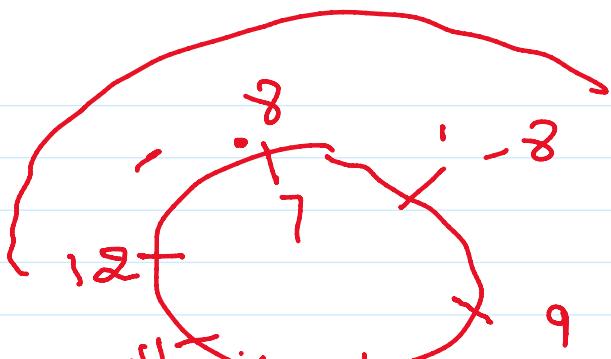
\rightarrow is balanced.)
=

Balance

$|ht_L - ht_R| \leq 1$
for each and every
node

S.W





$$\underline{\underline{LS}} =$$

$$\{8, -8, 9, -9, 10, -11, 12\} = \frac{11}{12}, \underline{\underline{LS}}$$

$$\{-8, 8, -9, 9, -10, 11, -12\} = \frac{11}{12} \text{ (Min)}$$

$$11 - (-11) = 22$$

DDD

DDDIIPP

11 D 1101 ↑ $C = \phi + \phi$,
 $D = \tau \phi \phi \phi$

12435768 8678

$C = \phi$

D DI DOD II ↑ $C = \tau \phi \phi$

D D ↑ ↑ ↑

$\text{dig} = \frac{10}{9}$

3 21 7654 89

3 21

5

30, 35, 40, 38, 35

1 2 3 1 1

4
100, 80, 60, 70, 50, 75, 85

1 1 1 2 1 2

1 2 3 1 1 ✓

100, 80, 60, 70, 65, 75, 85
1 2 3 4 5 6

ans =

ans = {1, 1, 1, 2, 1, 4, 6}



}

1 0 1 2 3 4
8 | 1 1 6 | 1 1 5

* 8
* 8 1 * 1 6
* 8 1 6 * 1 6 1
* 8 1 6 1 * 1 6 1 5
* 8 1 6 1 5

--- T - - - -
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
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21
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81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Subsequence

{ 8 1 6 1, 0, 3
1 6 1, 1, 3
1, 1, 2, 3
5, 4, 4 }

17+9
163 → 18?
 $\frac{17 \times 47 + 1}{2}$

|

100

2¹⁰⁰

✓

$2^{32} \rightarrow 1$
 2×2^{33}

$2^{\frac{70}{65}} \rightarrow 1$

7 6 1 5
 7 6 1 , 5
 2 ??
 ✓
 ✓
 ✓

↙ 7 6 1 5
 ✓ → 2
 ✓ → 1
 3 → 0
 4 → 0
 5 → 0

7, 1, 6, 1, 5 5 + 1 + 1

+ f f t t t t 3

Any posn 1) Knight : $\rightarrow \{ a+2, c+1 \}$
 $\rightarrow \{ a+1, c+2 \}$
 Edges 2) Rook : $\rightarrow (a == n-1) \rightarrow \text{for } i=1, i < n; i++$
 $\underline{(c == n-1)} \rightarrow \text{for } i=1, i < n; i++$
 Diagonals 3) Bishop \rightarrow Primary $\rightarrow \text{for } i=1; i < n; i++$
 Secondary $\rightarrow \text{for } i=1; i < n; i++$
 $(i+i < n)$

Revision
with you

→ Steve
→ binary
search

M P M P M P
2, 3, 5, 7, 9, 11
b c 2

4) Primes \rightarrow

-

→

15

-10
↳ -1 x

↳ Even \rightarrow Min
↳ Odd \rightarrow Max