

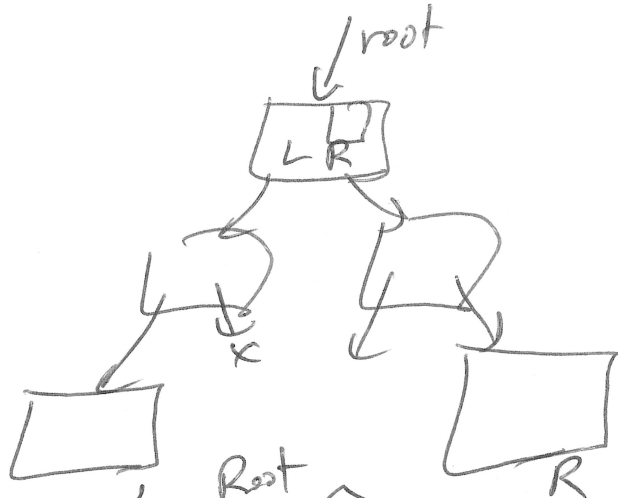
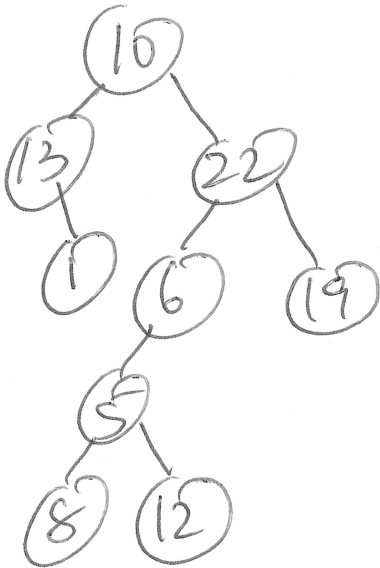
⑥ USACO reminder

① ~~Tras~~ WOH virtual this week and next

② Trees

Binary Tree

Data →
 left →
 right →



In: 13, 1, 10 8, 5, 12, 6, 22, 19
 Pre: 10, 13, 1, 22, 6, 5, 8, 12, 19
 Root L R

1) Rec ([13, 1], [13, 1])

2) Rec ([8, 5, 12, 6, 22, 19], [22, 6, 5, 8, 12, 19])

3) Print 10

f(int s1I, int e1I,
int s2I, int e2I)

if (s1I == e1I) {
 print; return;
}

}

Many Solutions

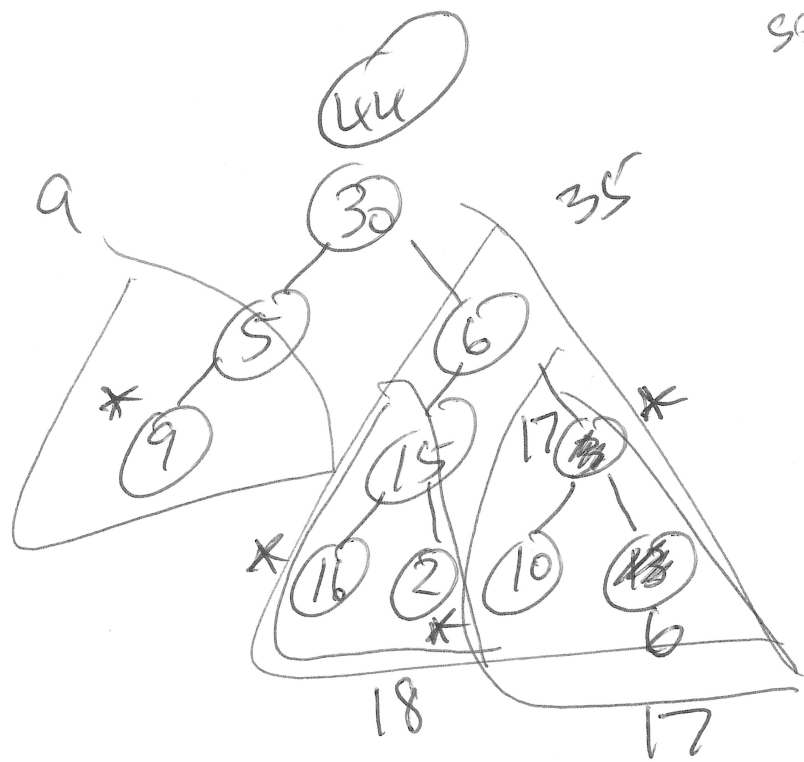
if (root == null) } avoid null ptr errors

if (root.left == null || root.right == null)

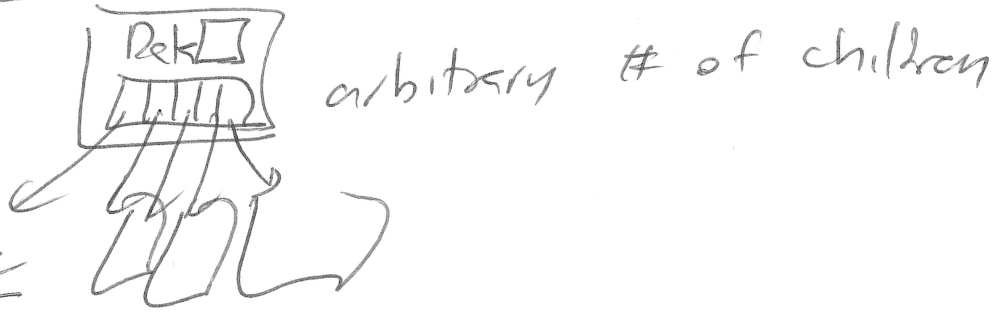
f(root.left)
f(root.right)

rec calls to th nodes
left, right
(sometimes both) $\rightarrow O(n)$
sometimes one

$\downarrow O(h)$
 \downarrow
height



Rooted Trees



each node is assign # 0 to n-1.

0 1 2 3 4 5

tree

data [] list of	par [2] empty	par [0] 1, 5	par [3] 12, 13, 14	empty	empty
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int
↓
kids
2, 3, 7

