Data Science & AI
&
NIC - Param

Python-For Data Science

Binary Tree

Lecture No.- 02

By- Pankaj Sharma Sir

Recap of Previous Lecture

Topic Trees Part 01

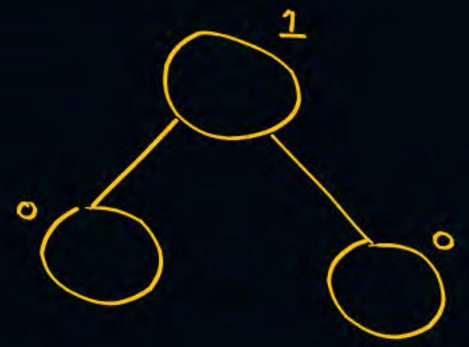
Topics to be Covered

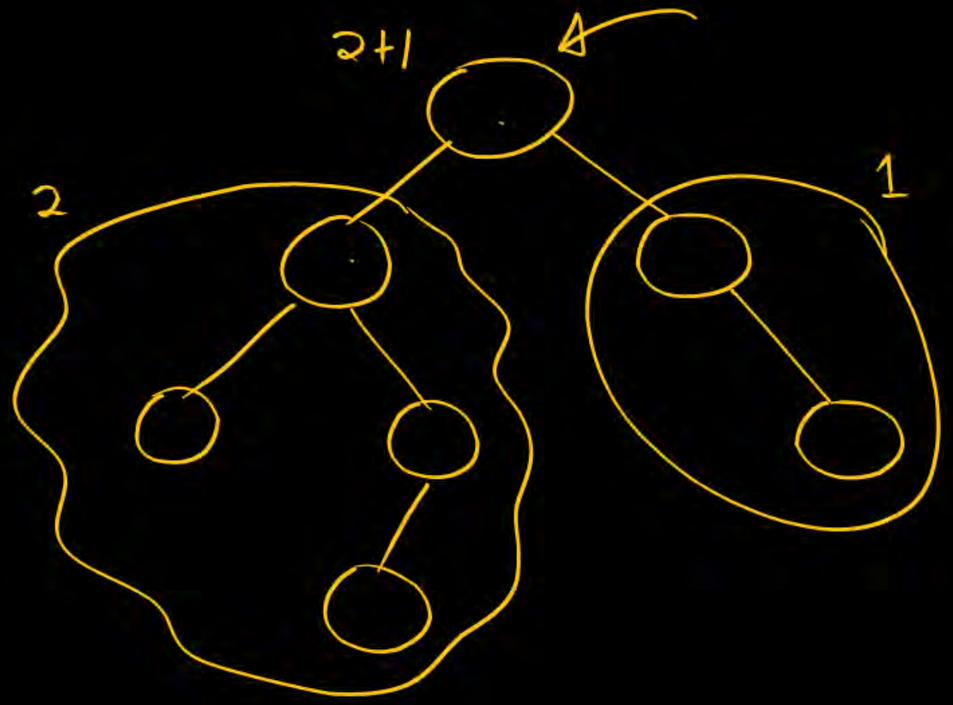
Topic Trees Part 02

Topic : Trees

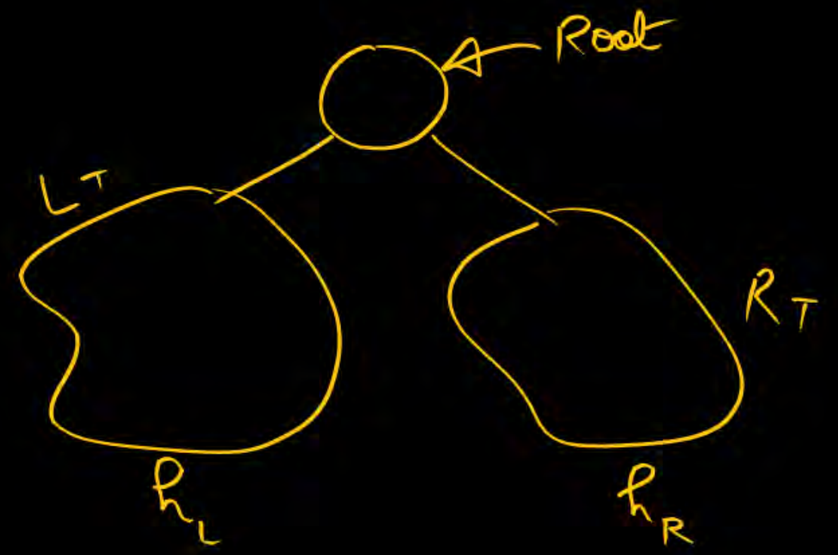
Height

h = 0




2+1
4
2
1

$$h(Root) = 1 + \max\Big(h(Root.Left),\ h(Root.Right)\Big)$$



$$1 + \max(h_L, h_R)$$

Question

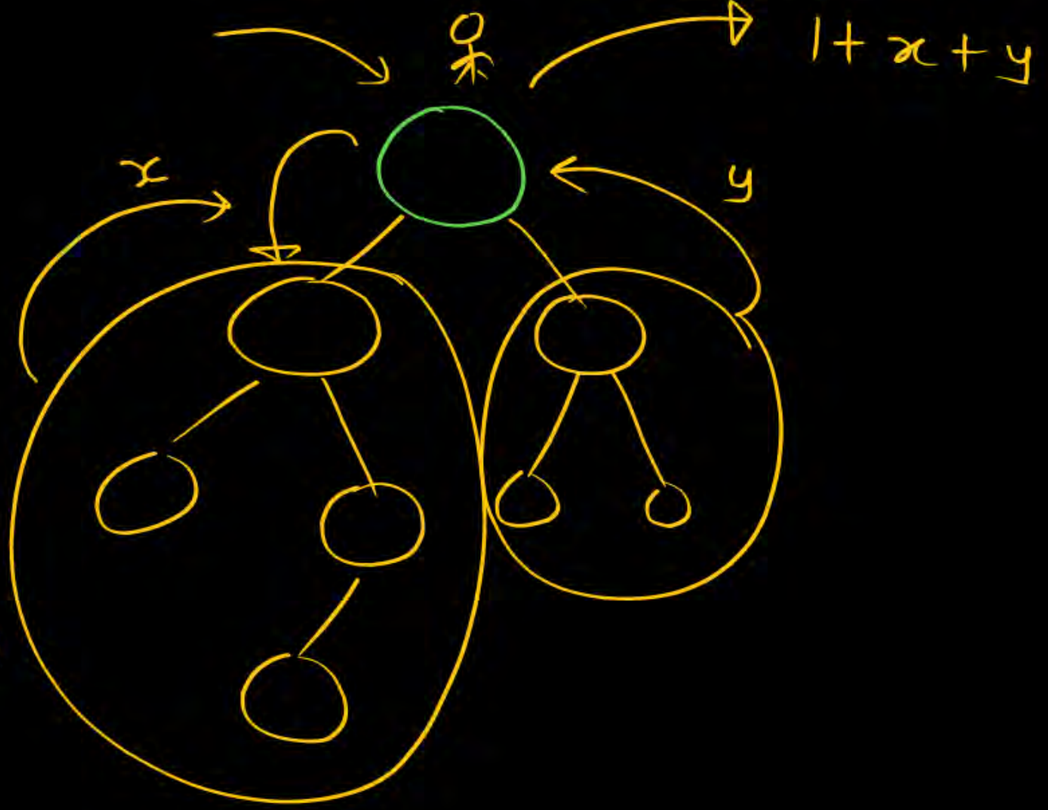

```
if Root is None :
    return -1
    return 0
return 1 + max( h(Root.left),
                h(Root.Right))
```

Logic

if Root is None:

return 0

Count(Root) = 1 + Count(Root.Left)
+ Count(Root.Right)




```
def count(self, root):
```

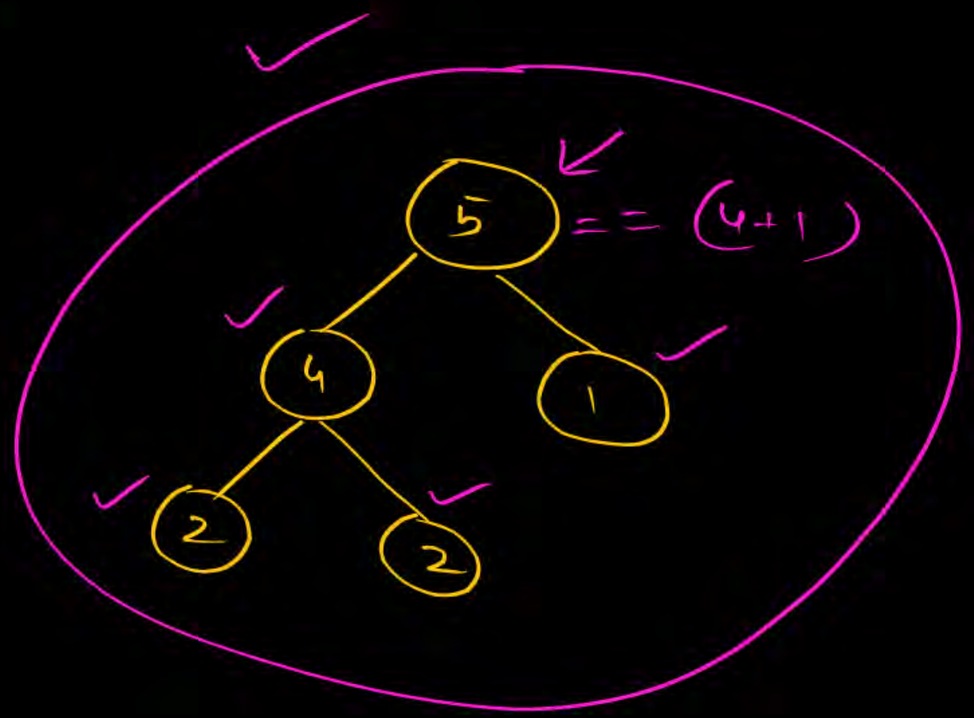
Root

i/p None

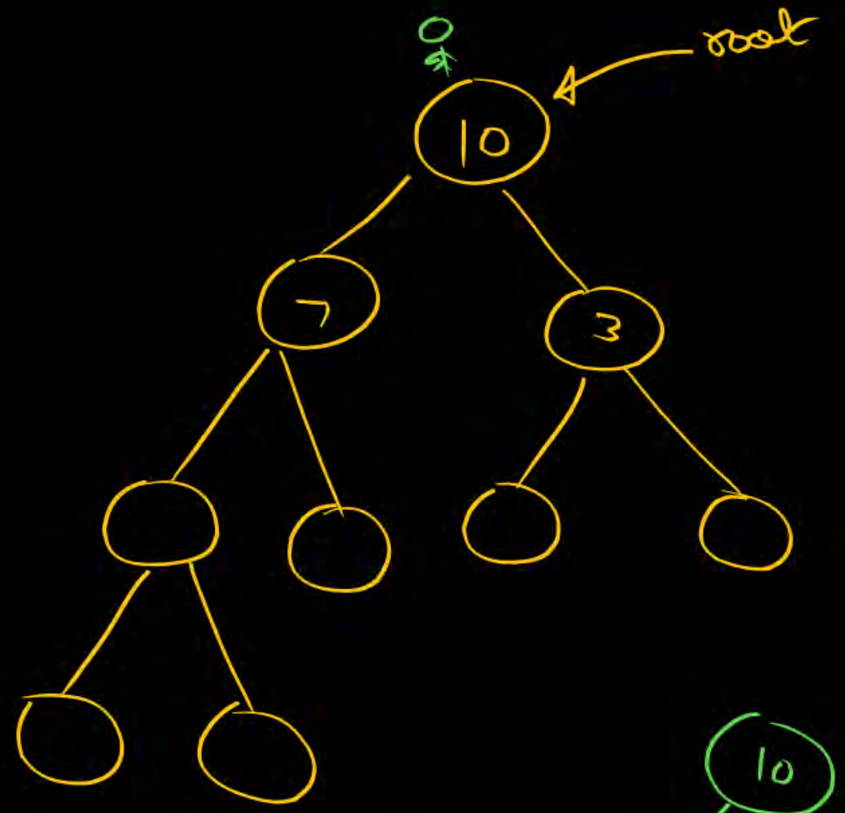
o/p 1

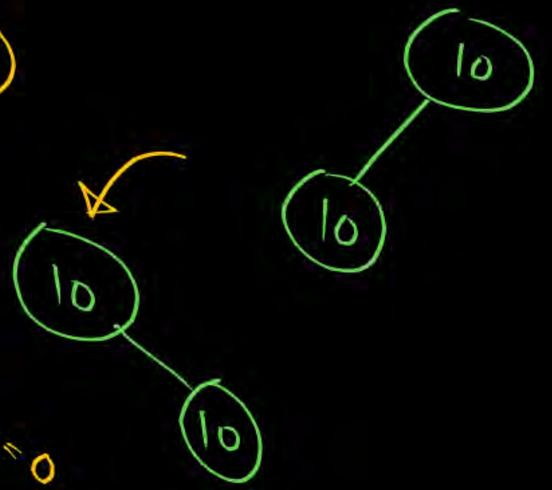
leaf

1

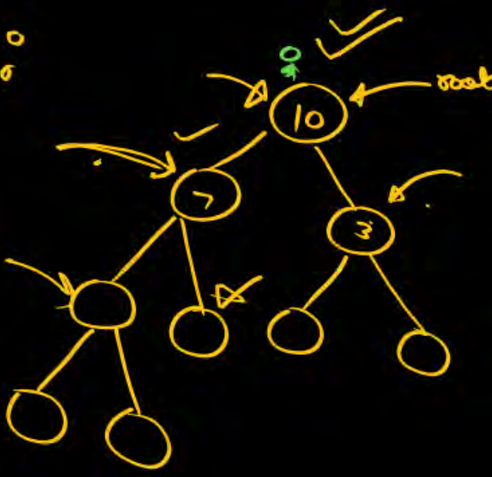


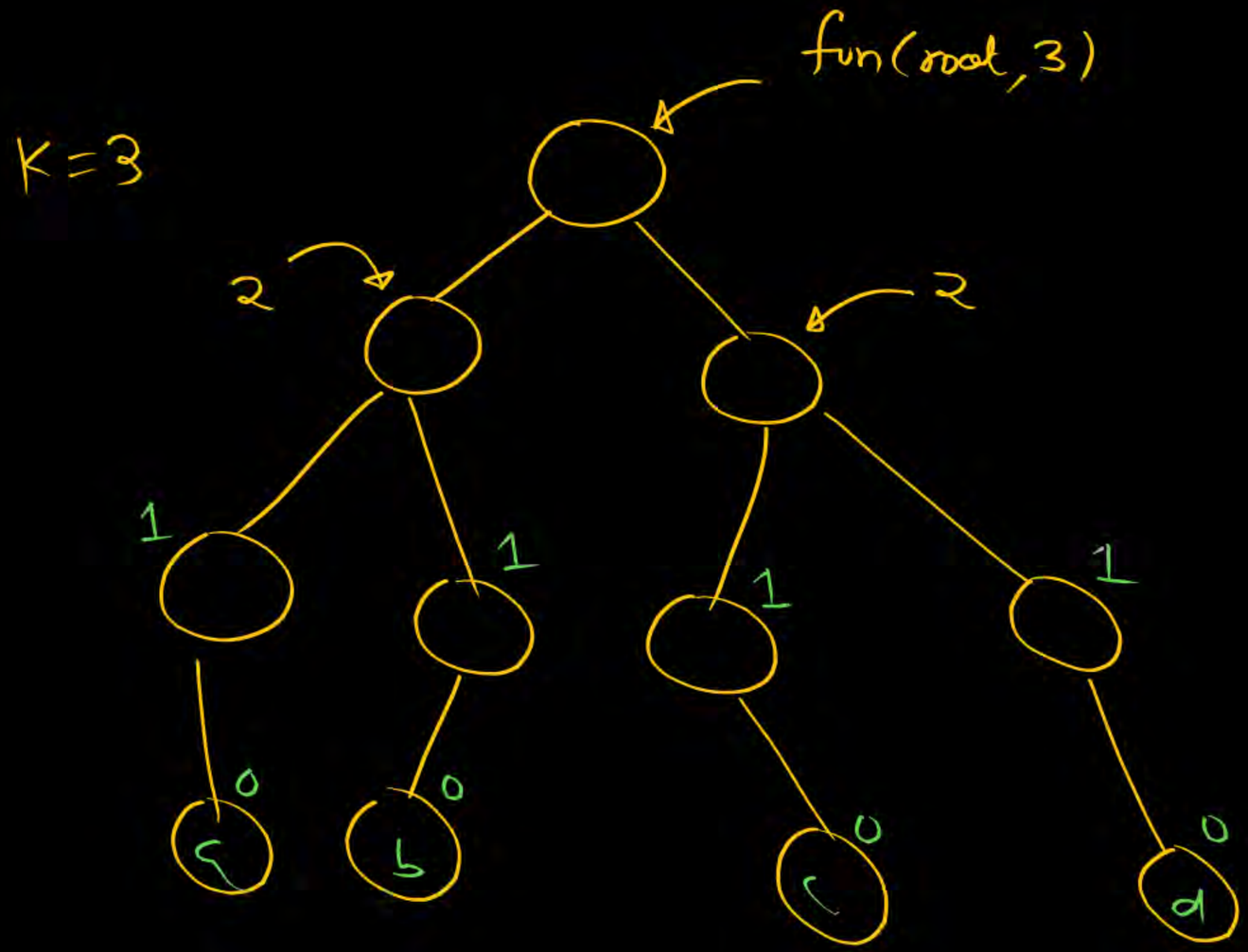
```
def (self, root):

    if root is None or
        (root.left is None
            and
         root.right is None) :

        return 1

    if   root.left :
        ldata = root.left.data
    else :
        ldata = 0
    if root.right :
        rdata = root.right.data
    else
        rdata =0
```

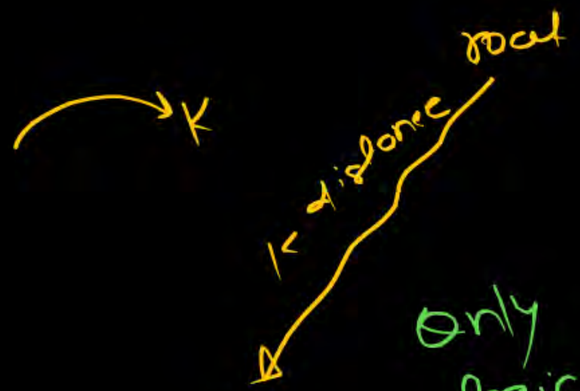




```
def isSum(self, root):
    if root is None or
        (root.left is None
            and
         root.right is None):
        return 1
    if root.left:
        ldata = root.left.data
    else:
        ldata = 0
    if root.right:
        rdata = root.right.data
    else
        rdata = 0
    if (root.data == ldata + rdata)
        and
    self.isSum(root.left)
        and
    self.isSum(root.right):
        return 1
    else:
        return 0
```




fun(root, 3)
K=3
2
2
1
1
1
1
0
0
0
0
c
b
c
d

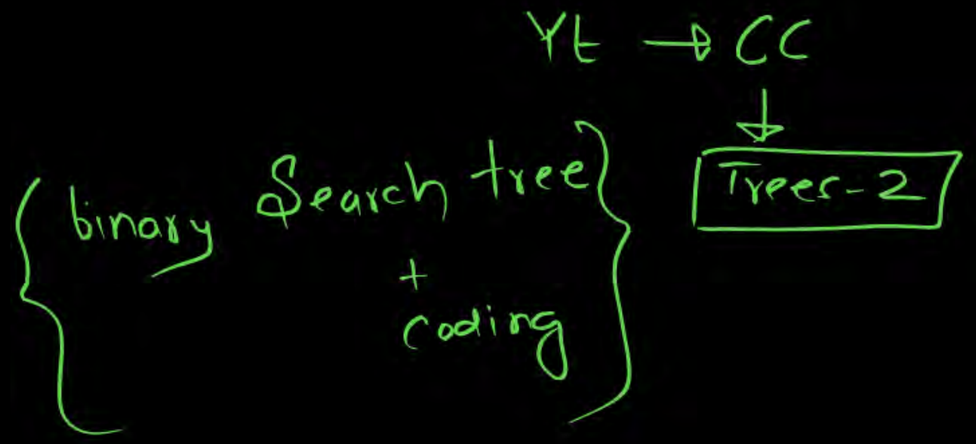


not exact code

```
def f(self, root, k):
    if root is None:
        return

    if k == 0:
        print root.data
            or
        l.append(root.data)

    self.f(root.left, k-1)
    self.f(root.right, k-1)
```

identical

```
def f(root1, root2):

    if root1 is None
            and
       root2 is None:
            return 1
    elif (root1 and root2):
    return (root1.data == root2.data) and f(root1.left, root2.left) and f(root1.right, root2.right)
    else:
            return False
```


Yt → CC
Trees-2
binary Search tree
+
coding

THANK - YOU