Python IV – Lesson 32

Date: Jan 8, 2022

Agenda

- DFS
- Leetcode 111 using DFS
- Leetcode 112
- CCC 2016 J5
- CCC 2018 J5

Proverbs 11:12

- “Whoever derides their neighbor has no sense, but the one who has understanding holds their tongue.”

CCC questions

Introduction:

https://cemc.uwaterloo.ca/contests/computing/details.html

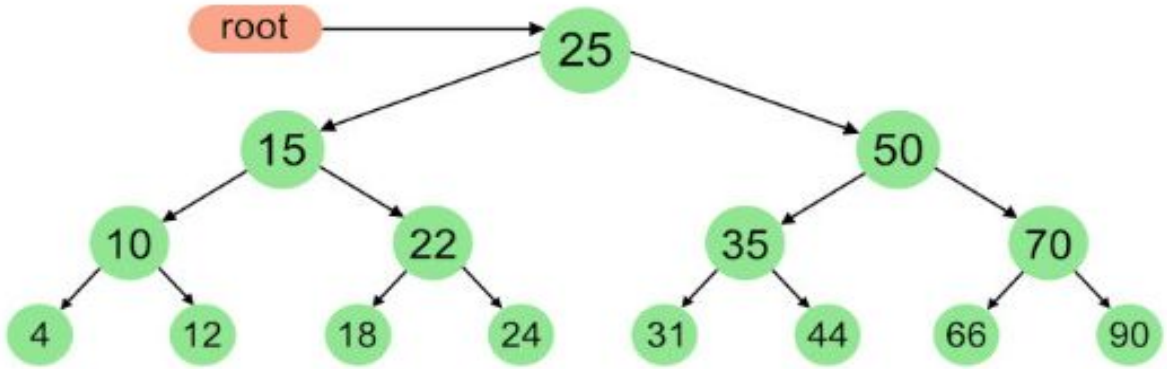
Past contests:

https://www.cemc.uwaterloo.ca/contests/past_contests.html

DFS

Depth First Search

We will be using recursion to keep track of all the previous (parent) nodes while traversing.



InOrder(root) visits nodes in the following order:

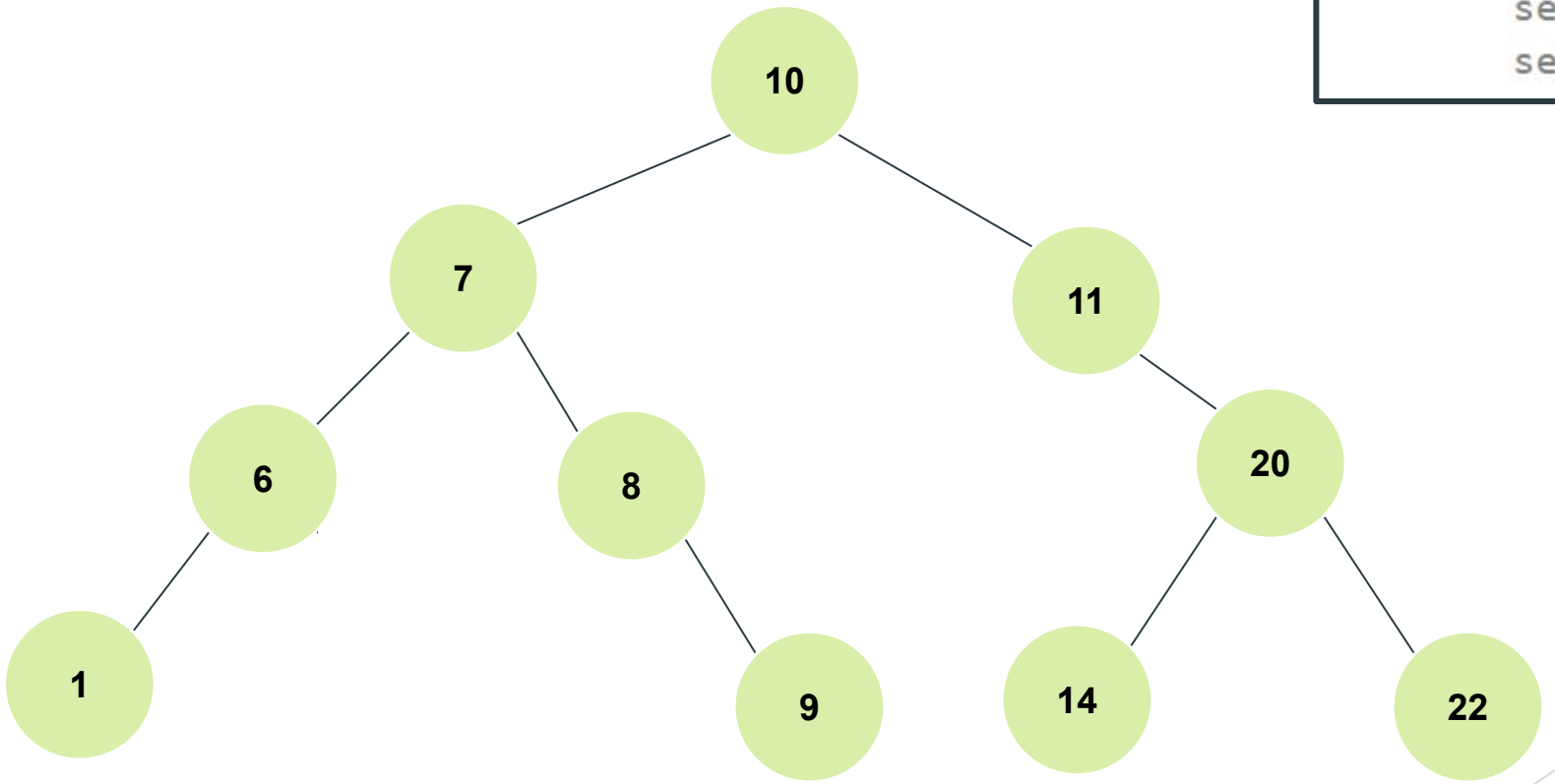
4, 10, 12, 15, 18, 22, 24, 25, 31, 35, 44, 50, 66, 70, 90

```
class Node:
    def __init__(self, key):
        self.left = None
        self.right = None
        self.val = key
```

1. Traverse the left subtree, i.e., call Inorder(left->subtree)
2. Visit the root.
3. Traverse the right subtree, i.e., call Inorder(right->subtree)

DFS

Depth First Search




```
class Node:
    def __init__(self, key):
        self.left = None
        self.right = None
        self.val = key
```

DFS

```
def dfs_in_order(root):
  if root:
    dfs_in_order(root.left)
    print(root.val) # you can add any other logic
    dfs_in_order(root.right)
```

```
def dfs_pre_order(root):
  if root:
    print(root.val)
    dfs_pre_order(root.left)
    dfs_pre_order(root.right)
```

```
def dfs_post_order(root):
  if root:
    dfs_post_order(root.left)
    dfs_post_order(root.right)
    print(root.val)
```

```
class Node:
    def __init__(self, key):
        self.left = None
        self.right = None
        self.val = key
```