26 December 2016

Interview Preparation

Lecture: 8 - Trees

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Doubts from last class?

BT : Find the odd one out

You are given 20 bottles containing 100 pills each. 19 of these bottles have 1gm pills and one contains 1.2 gram pills. Given a scale find the odd one out. You can only use the scale once.

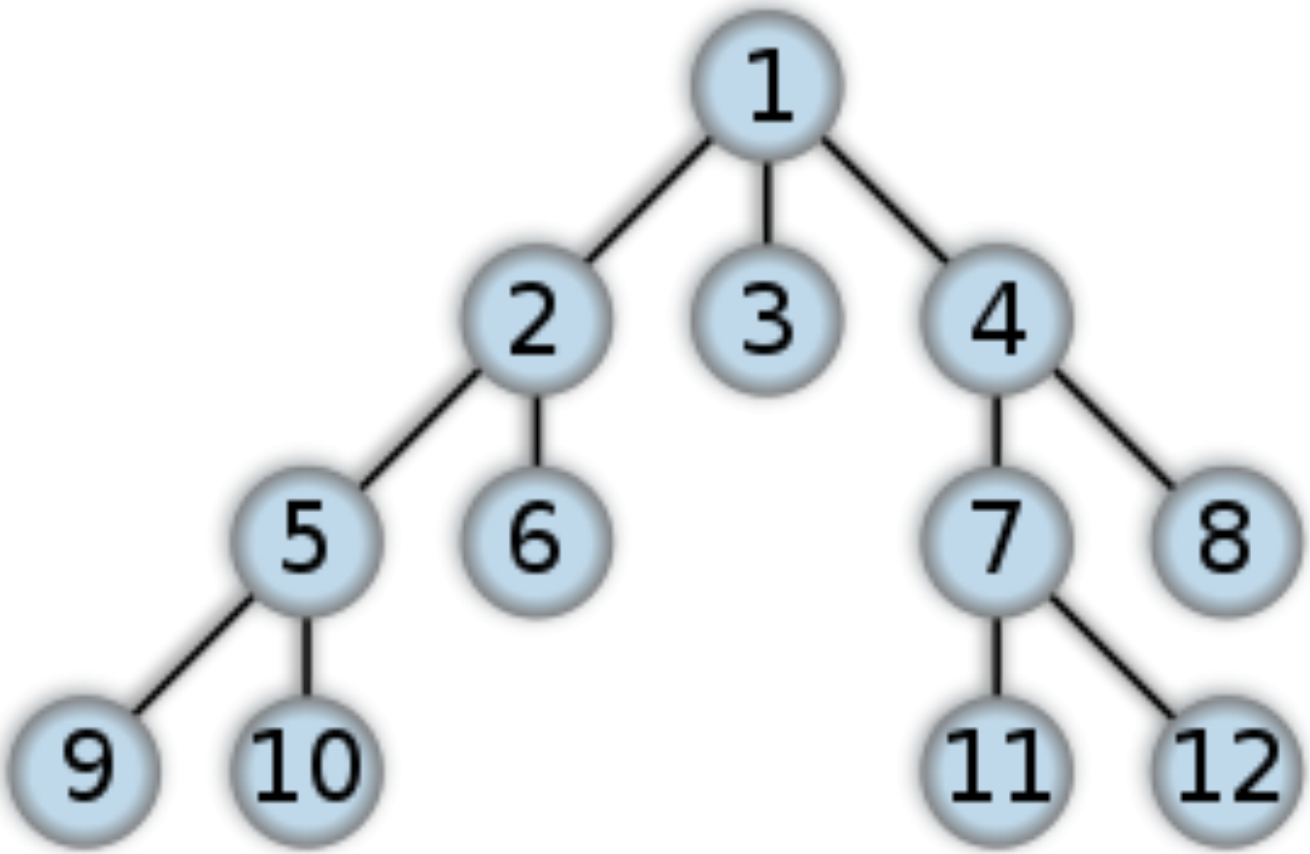
BT : Eggs and floors

100 Floors and 2 eggs. Find out max n such that dropping an egg from nth floor doesn't break it. Minimize number of drops.

BT: Timely payments

A Contractor is doing work for 7 days at your home, you need to pay him 7000$ in total. Every day you need to pay him 1000$ only. To Pay him you have a gold plate worth 7000$, but you can cut it only twice

Trees



How to Implement tree

```
struct node{
    int data;
    node** children;
}
```

Basic tree Algorithms

1. Take user inputs and build a generic tree.
2. Implement BFS
3. Find max depth of a generic tree
4. Return the node with the largest element

Binary Trees

```
struct node{
    int data;
    node* left;
    node* right;
}
```

Lets discuss few problems

1. Find diameter of a binary tree
2. Evaluate an expression tree
3. Find lowest common ancestor given two nodes
   - Do it without storing nodes in a Data Structure

Next Class Topics?

- Binary Trees
- Binary Search Trees

Thank you

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Problems

- Find next largest element in a Binary Tree. (Not a BST)
- Given a Binary tree, write code to create a separate linked list for each level
- Given a Binary tree check if it is balanced i.e. depth of the left and right subtrees of every node differ by 1 or less

Problems

- You have a binary tree with non-negative numeric values stored in its nodes, you need to find out the maximum possible sum of all the nodes. Selection of nodes for the sum follows following constraint:

  If you have selected any node for the sum, you can not select its immediate parent and its children for sum.