Saturday, 19 March 16

# Crux

## Lecture -16

Data Structures -3

Trees - 1

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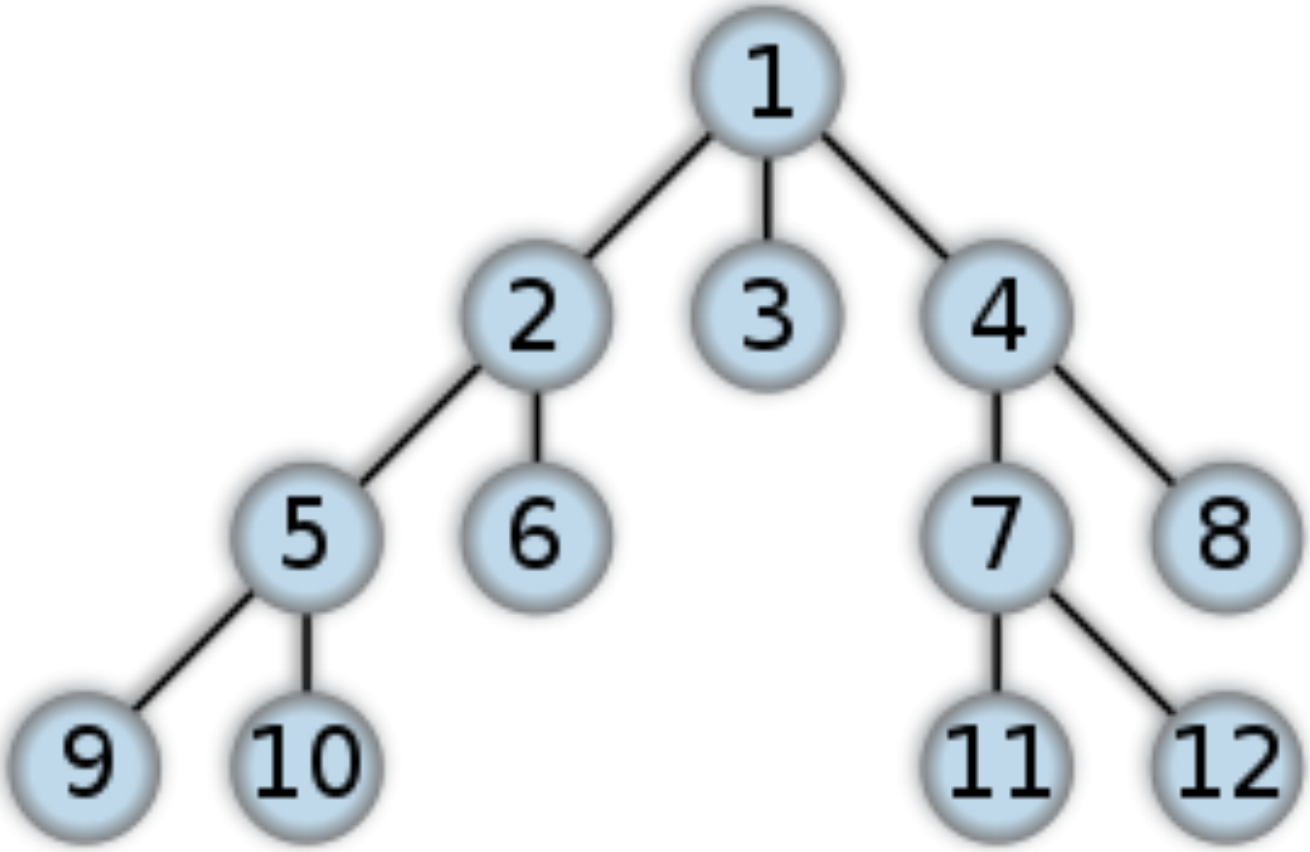
# Assignment doubts?

# What's common between a file system and a company's organizational structure?

# Trees




CODING BLOCKS

# Tree Terminologies

- Node
- Root
- Children
- Parent
- Ancestor
- Descendants
- Sibling
- Leaves

# Tree Important Properties

- Degree of a Node
- Depth of a Node
- Height of Tree

# How to Implement a Node of a Tree

# Node of a Tree

```
Public class node{
    int data;
    node[] children;
    node parent; //Optional
}
```

# How to Implement a Tree

- Use Nodes to create tree in every program
- Define a Tree class

# Tree class

```
Class Tree {
  private node root;
  public int size();
  public boolean isEmpty();
  public node root();
  public node parent(node);
  public node[] children(node);
  // etc etc
}
```

# Lets see how to input and output Tree

- Write a function to take tree as input from user
- Print out a tree

# Lets discuss few problems

- Find Height of a Tree
- Print all the elements at depth K.

# Lets discuss few problems

- Count number of nodes in a tree
- Find sum of all nodes

# Your Turn

- Find the node with largest data in a tree

# Your Turn

- Find number of Nodes greater than an integer x
- Find the node for which sum of the data of all children and the node itself is maximum

# BT - Daughters' Ages

Local Berkeley professors Dr. X and Dr. Y bump into each after a long time.

X hey! how have you been?

Y great! i got married and i have three daughters now

X really? how old are they?

Y well, the product of their ages is 72, and the sum of their ages is the same as the number on that building over there

X right, ok ... oh wait ... hmm, i still don't know

Y oh sorry, the oldest one just started to play the piano

X wonderful! my oldest is the same age!

**How old are the daughters?**


# Thank You!

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