

# Nucleus

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Java Foundation & Data Structures

Lecture 18 : Trees



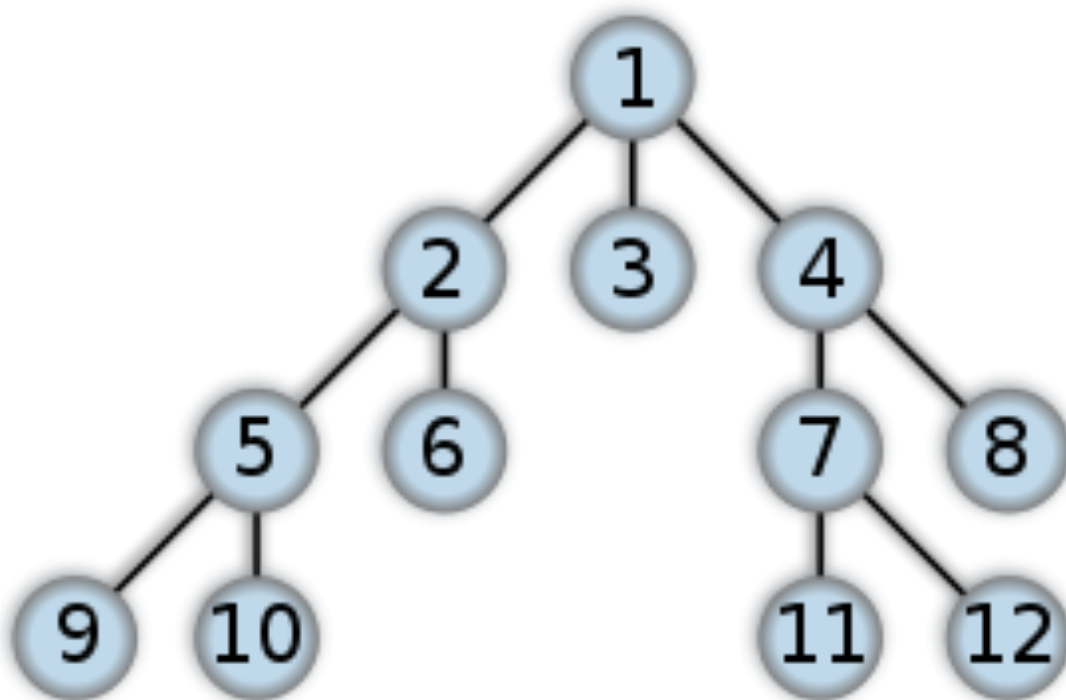
Wednesday, 5 July 17

# Doubts from Last Class ?

*Any doubts on assignment ?*

# Trees

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



# Tree Terminologies

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

# Tree Important Properties

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



# How to Implement a Node of a Tree

# Node of a Tree

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

# How to Implement a Tree

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- 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

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

# Lets discuss few problems

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

# Lets discuss few problems

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

- Find the node with largest data in a tree



- 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



Thank you

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