CODING BLOCKS

Lecture-15

Data Structures

- Generic Trees

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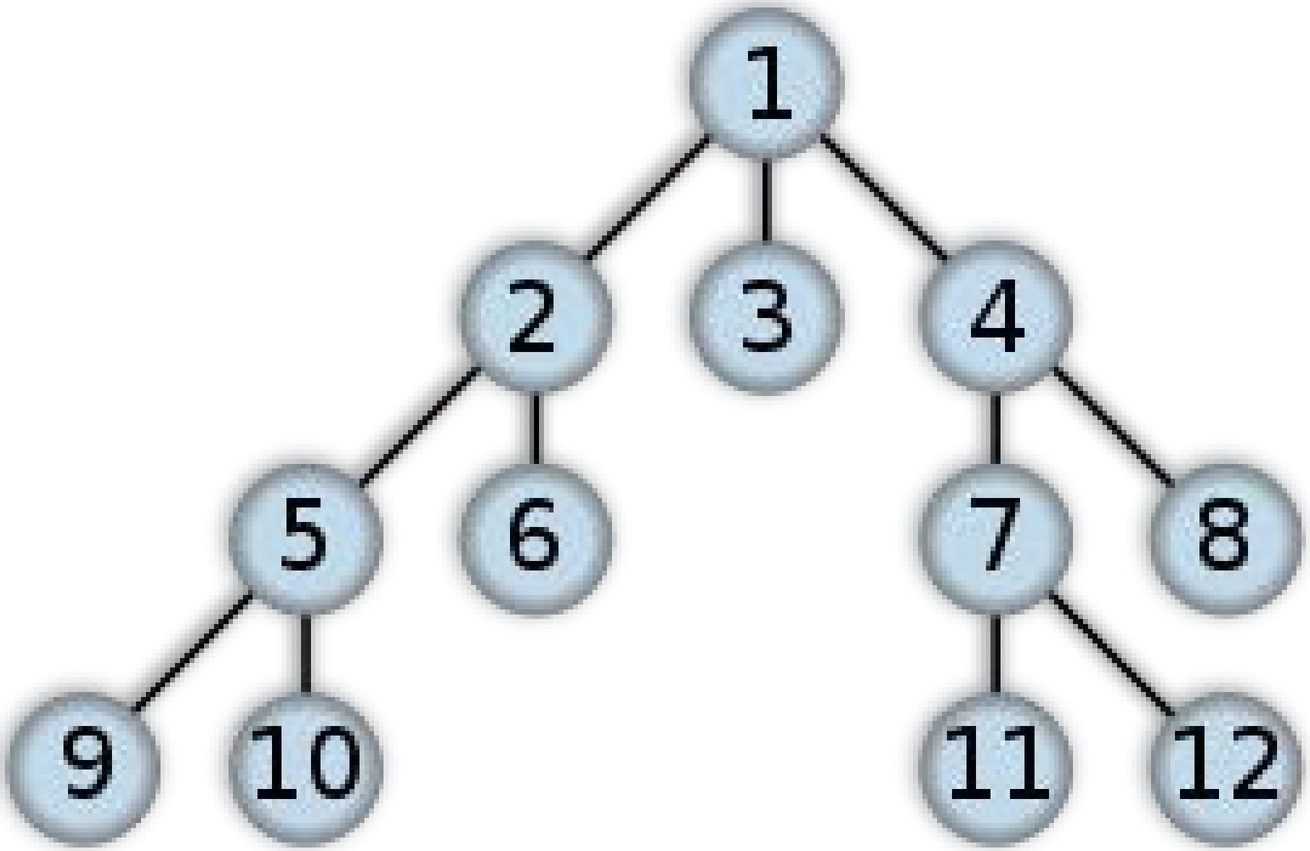
Doubts ?

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

CODING BLOCKS

Trees



Tree Terminologies

1. Node
2. Root
3. Children
4. Parent
5. Ancestor
6. Descendants
7. Sibling
8. Leaves

How to Implement a Node of a Tree

```
class node{
    int data;
    node** children;
    int children_count;
    node* parent; //Optional
}
```

Tree Important Properties

1. Degree of a Node
2. Depth of a Node
3. Height of Tree

How to Implement a Tree

1. Use Nodes to create tree in every program
2. Define a Tree class

Tree class

```
Class Tree {
    node* root;
    int size();
    boolean isEmpty();
    node* root();
    node* parent(node*);
    node** children(node*); // etc etc
}
```

Lets see how to input and output Tree

1. Write a function to take tree as input from user
2. Print out a tree

Tree Important Properties

1. Degree of a Node
2. Depth of a Node
3. Height of Tree

Lets discuss few problems

1. Find the node with largest data in a tree
2. Print all the elements at depth K.

Your Turn

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

A tree walk or traversal is a way of visiting all the nodes in a tree in a specified order.

Lets code these tree traversals

1. Preorder Traversal(Recursive)
2. Preorder Traversal(Iterative)
3. Postorder Traversal
4. Levelorder Traversal

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Thank You!

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