C++

LAUNCHPAD

CODING BLOCKS

Lecture-19

Data Structures

- Binary Trees

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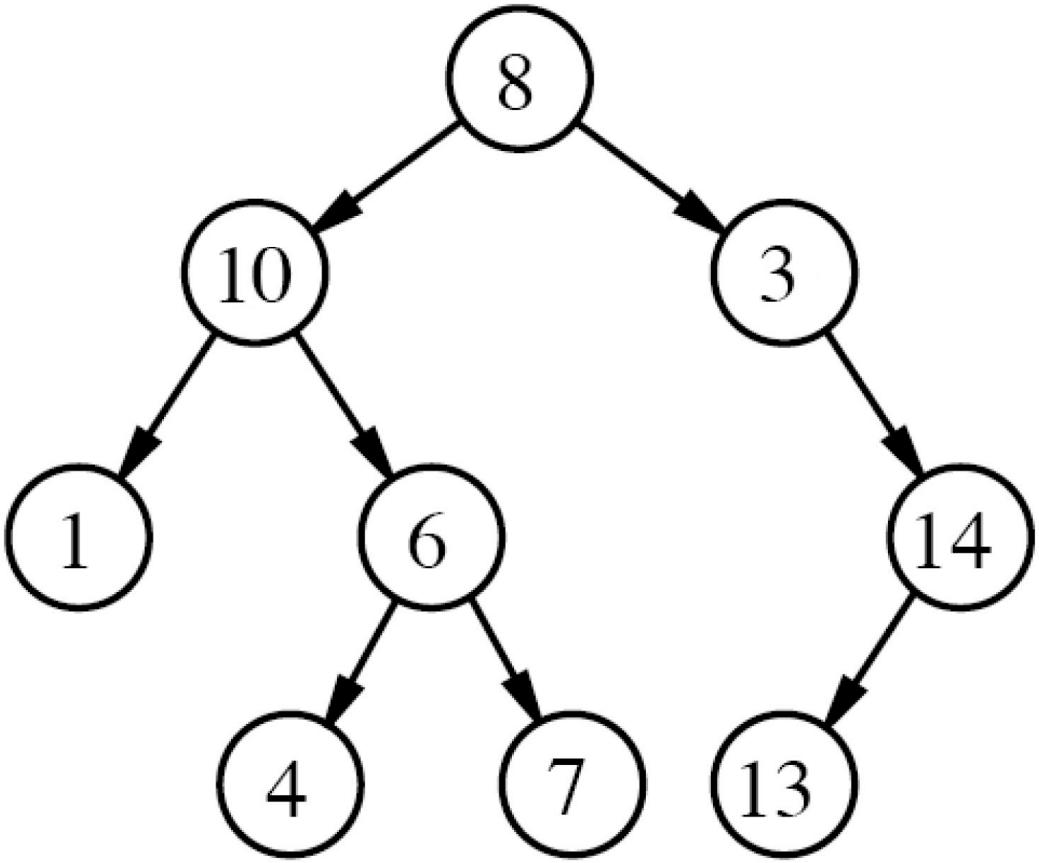
Binary Trees

Binary Trees



Tree Terminologies

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

Binary Tree Node

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

How to Implement a Tree

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

Lets see how to input and output Tree

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

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
2. Postorder Traversal
3. Inorder Traversal
4. Levelorder Traversal

Lets discuss few problems

1. Count number of Nodes
2. Find the node with largest data in a tree

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

Tree Important Properties

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

Lets discuss a problem

1. Print all the elements at depth K.
2. Level wise printing such that each level is printed in a new line
3. Find diameter of a binary tree

Your Turn

1. Find a node in Binary Tree
2. Mirror a binary tree

Building tree using Preorder and Inorder traversal

Building tree using Postorder and Inorder traversal

Building tree using Preorder and Postorder traversal

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Thank you !

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