27 Lecture - CS301

Important Subjective

1. **What is a binary tree?**
   A binary tree is a data structure in which each node has at most two children, referred to as the left child and the right child.

2. **What is the height of a binary tree?**
   The height of a binary tree is the maximum number of edges between the root node and any leaf node in the tree.

3. **What is a full binary tree?**
   A full binary tree is a binary tree in which every node other than the leaves has two children.

4. **What is a complete binary tree?**
   A complete binary tree is a binary tree in which all the levels are completely filled except possibly for the last level, which is filled from left to right.

5. **What is a balanced binary tree?**
   A balanced binary tree is a binary tree in which the difference in height between the left and right subtrees of any node is at most one.

6. **What is an AVL tree?**
   An AVL tree is a self-balancing binary search tree in which the heights of the left and right subtrees of every node differ by at most one.

7. **What is a red-black tree?**
   A red-black tree is a self-balancing binary search tree in which each node has a color either red or black, and the root node is always black.

8. **What is an expression tree?**
   An expression tree is a binary tree in which each internal node represents an operator and each leaf node represents an operand.

9. **What is a binary search tree?**
   A binary search tree is a binary tree in which the left subtree of a node contains only nodes with values less than the node's value, and the right subtree contains only nodes with values greater than the node's value.

10. **What is the maximum number of nodes in a binary tree of height h?**
    The maximum number of nodes in a binary tree of height h is 2^(h+1) - 1.