Problem Solving on BT & BSTs

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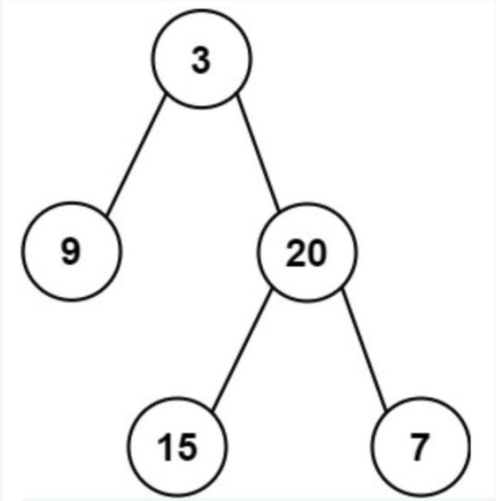
Problem 1:

Given Preorder and Inorder traversals, construct the binary tree.

Example:

Input: preorder = [3,9,20,15,7], inorder = [9,3,15,20,7]

Output:

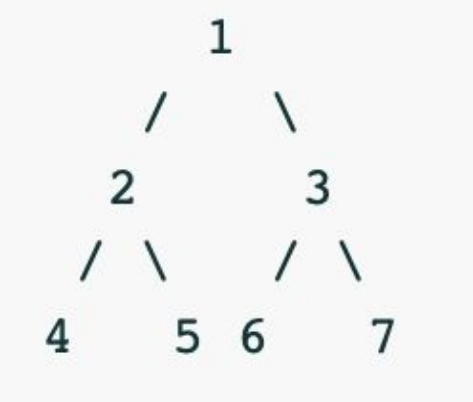


Problem 2:

Given a binary tree, find a path from root to any given node x.

Example:

Input:

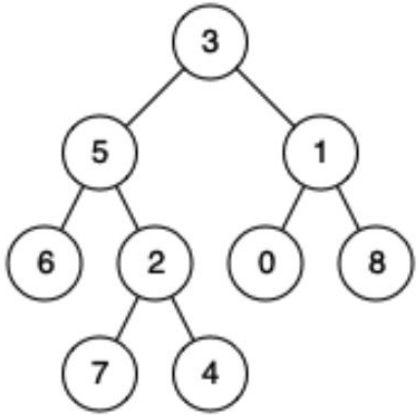


x = 5

Output: [1, 2, 5]

Problem 3:

Given a binary tree and two nodes, find the lowest common ancestor (LCA) between them. According to the definition of LCA on Wikipedia: “The lowest common ancestor is defined between two nodes p and q as the lowest node in T that has both p and q as descendants (where we allow a node to be a descendant of itself).”

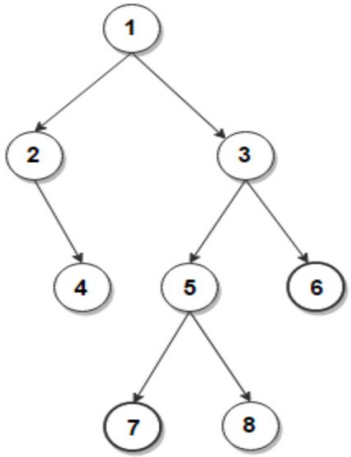


Input: root = [3,5,1,6,2,0,8,null,null,7,4], p = 5, q = 1
Output: 3

Problem 4:

Find the distance between two nodes in a binary tree. The distance between two nodes is referred to as the minimum number of edges to be traversed to reach one node to other node.

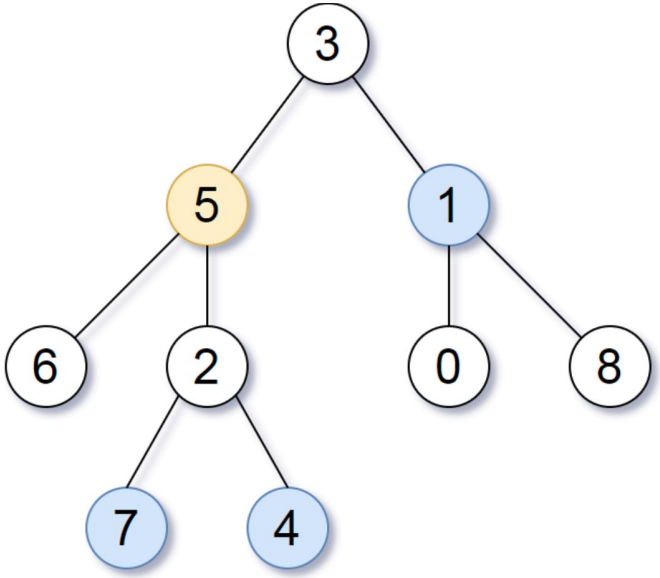
Example:



Distance between nodes 7 & 6 is 2.
Distance between nodes 4 & 8 is 5.

Problem 5: All Nodes Distance K in Binary Tree

Given a binary tree, a target node, and an integer value k, return all the nodes in an array that have a distance k from the target node.



Input:
root = [3,5,1,6,2,0,8,null,null,7,4], target = 5, k = 2
Output: [7,4,1]

Explanation:
The nodes that are a distance 2 from the target node (with value 5) have values 7, 4, and 1.

Thank you!