CS 261 Recitation 5: Binary Search Tree

In order to get credit for the recitation, you need to be checked off by the end of recitation. For non-zero recitations, you can earn a maximum of 3 points for recitation work completed outside of recitation time, but you must finish this recitation before the next recitation. For extenuating circumstance, contact your Instructor.

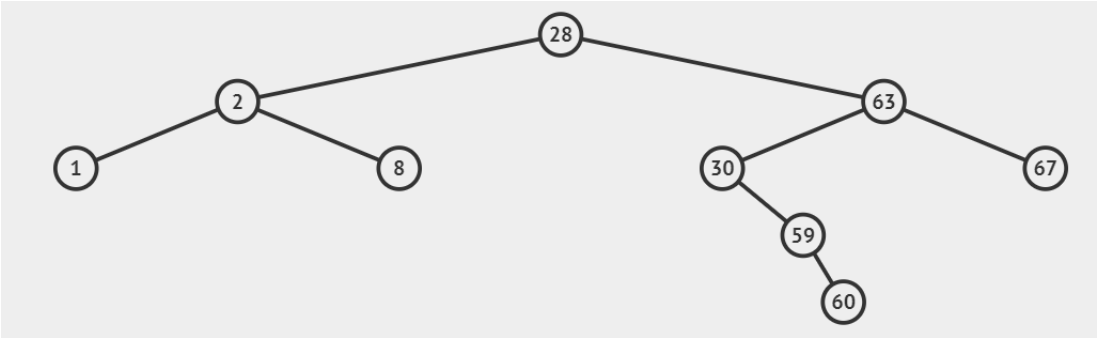
Group work, and individual work are highlighted

Recitation 5 Grade Breakdown:

- Part 1: BST Operations 4 pts
- Part 2: Find maximum and minimum depth of a BST 6 pts

Part 1: BST Operations

1. Given the following BST, draw the path to find the node with key 60 and 31

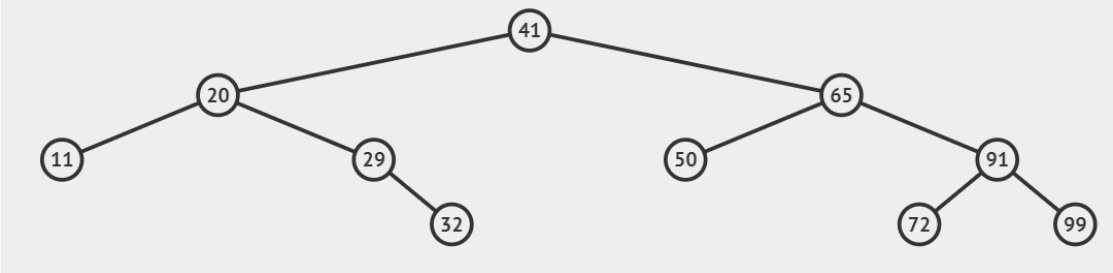


2. Draw a BST with the insertions in the following order (assuming the tree is currently empty, i.e., root = NULL):
   2 10 15 18 26 30 48

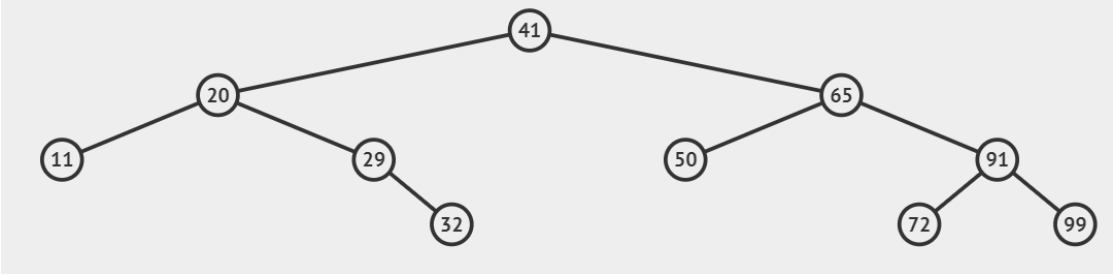
   18 10 2 15 30 26 48

   What difference did you notice?

3. Given the following BST, draw the BST after removing the node with key 29:

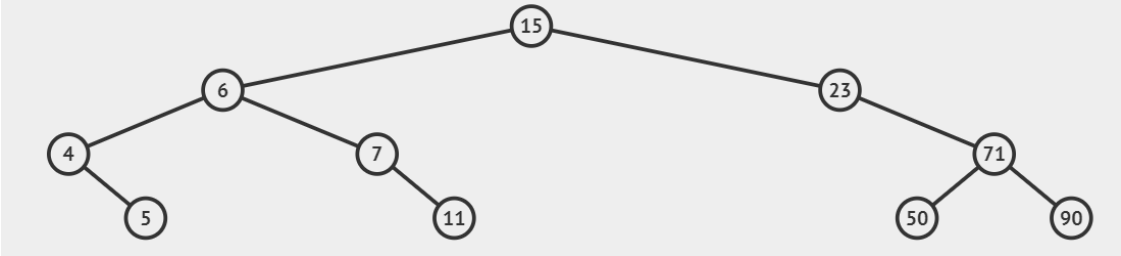


Given the following BST, draw the BST after removing the node with key 65:



What's it in-order successor?

4. Given the following binary search tree,



Pre-order traversal:

In-order traversal:

Post-order traversal:

Level-order traversal:

Part 2: Find the Maximum and Minimum Depth of a BST

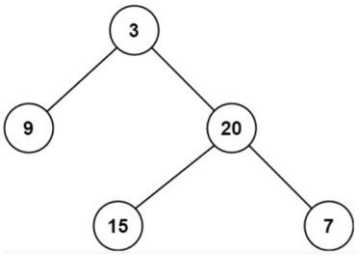
Download and unzip the start code: (wget command is recommended)

wget https://classes.engr.oregonstate.edu/eecs/summer2022/cs261-001/recitations/rec5.zip

(6 pts) Problem Statement: Given a binary search tree, find its maximum and minimum depth. (Note: the depth of the root node is 0)

The maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node.
The minimum depth is the number of nodes along the shortest path from the root node down to the nearest leaf node.

Example 1:

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Output: max depth: 2 (3-20-15); min depth: 1(3-9)
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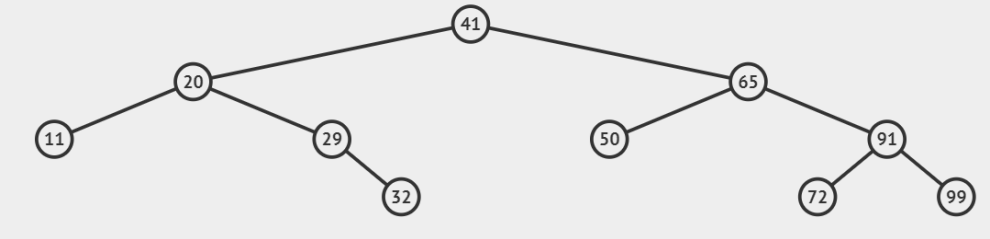
Example 2:

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Output: max depth: 3 (41-20-29-32); min depth: 2 (41-20-11)
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Assuming;

- The depth of the root node is 0
- The depth of an empty tree is -1
- The number of nodes in the tree is in the range [0, 10^5].
- -1000 <= node.val <= 1000

Make sure you get checked off by showing them the output of your program, your report, and your group work before the end of your recitation section.