

Binary Search Tree In-class Exercise

Answer the following problems as clearly as possible.

1. What is the difference between an internal node and a leaf node?

Internal: Anything between the root and the leaf
Is a node has children

Leaf Node: Is a node without children, very bottom of the tree.

2. What is the height of a node?

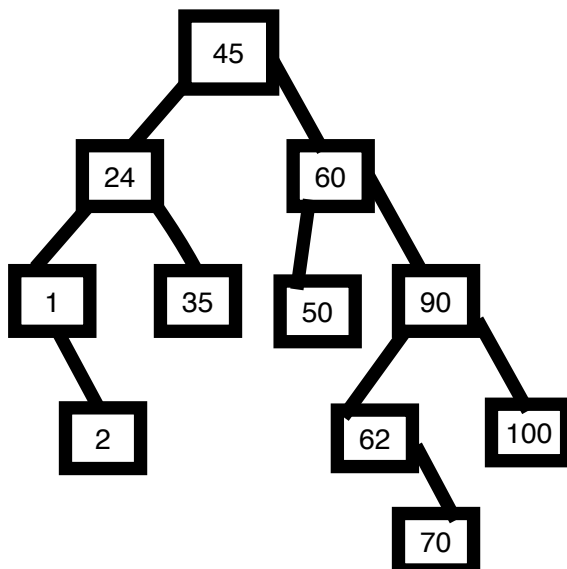
Is from the very bottom leaf node and the root.

3. Why is it problematic to add elements in sorted order to a binary search tree?

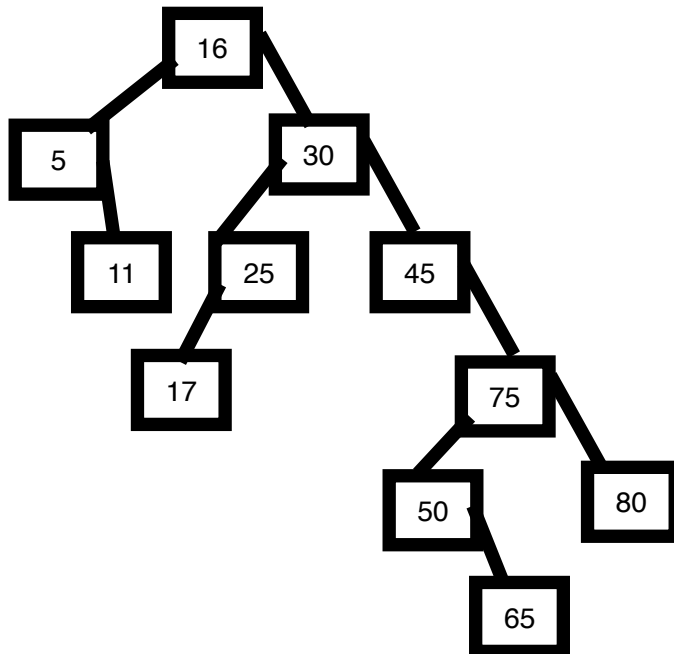
Its gonna be unbalanced tree.

For the following problems, draw the binary search tree that would result from adding the items from left to right.

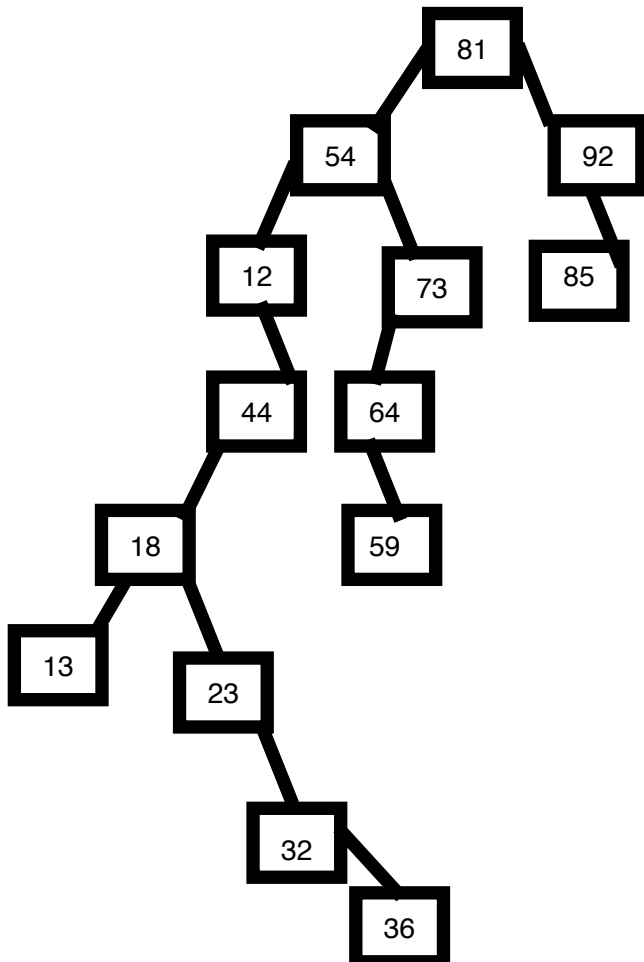
1. 45, 60, 24, 35, 1, 50, 2, 90, 62, 70, 100



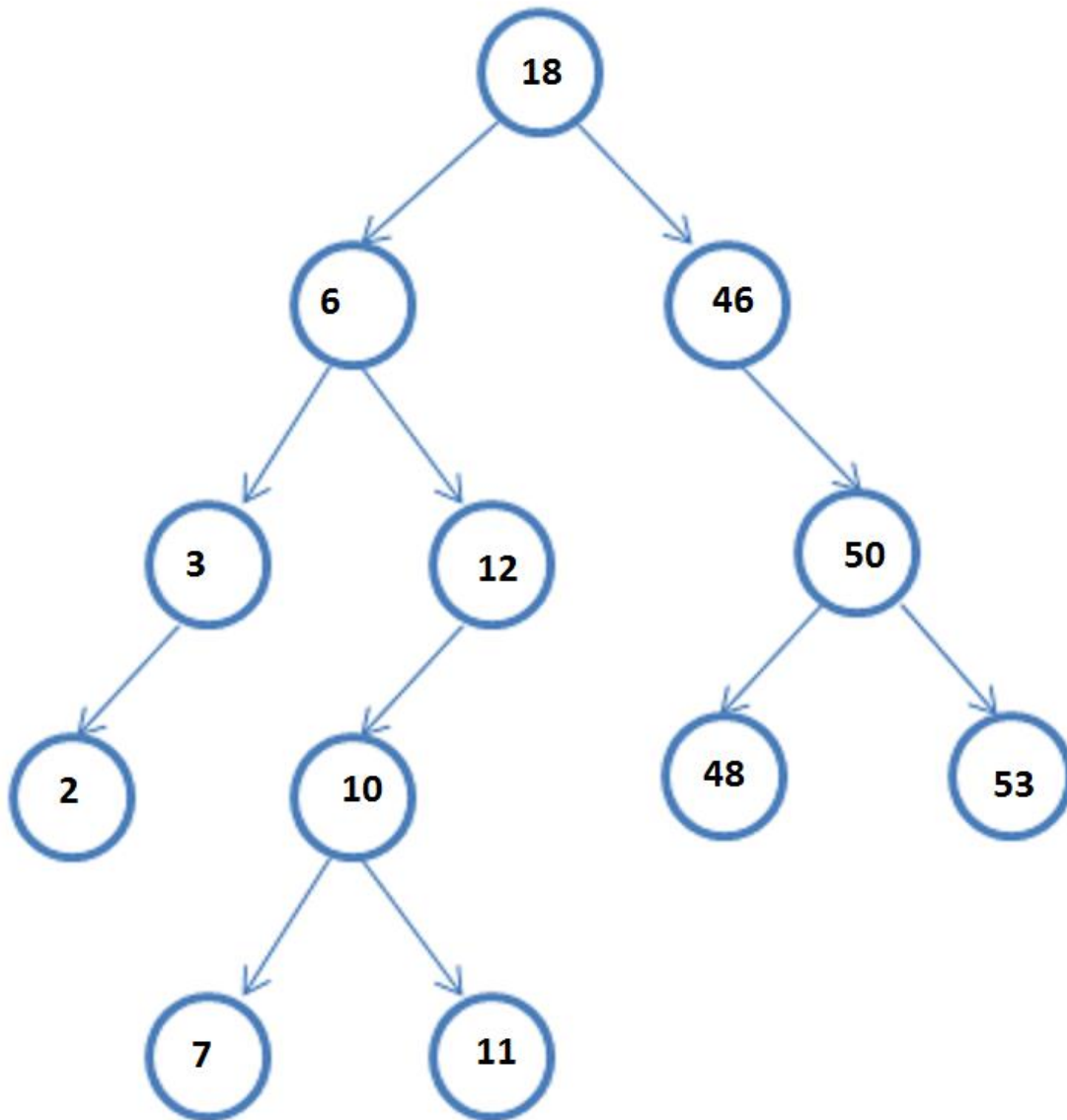
2. 16, 30, 45, 75, 5, 25, 50, 17, 11, 65, 80



3. 81, 92, 54, 12, 44, 18, 73, 85, 64, 59, 13, 23, 92, 32, 36, 81



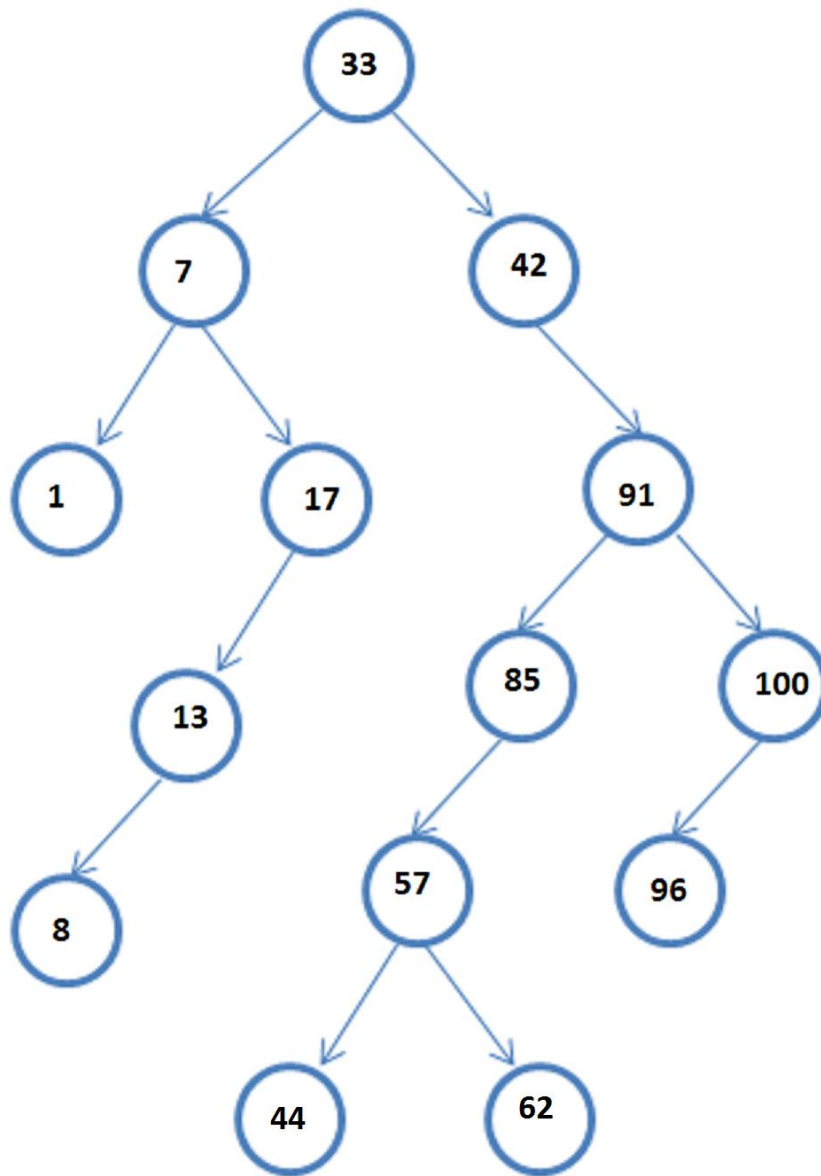
For the following trees, give the preorder, inorder and postorder search results.



Preorder: 18, 6, 3, 2, 12, 10, 7, 11, 46, 50, 48, 53

Inorder: 2, 3, 6, 7, 10, 11, 12, 18, 46, 48, 50, 53

Postorder: 2, 3, 7, 11, 10, 12, 6, 48, 53, 50, 46, 18



Preorder: 33, 7, 1, 17, 13, 8, 42, 91, 85, 56, 44, 62, 100, 96

Inorder: 1, 7, 8, 13, 17, 33, 42, 44, 57, 62, 85, 91, 96, 100

Postorder: 1, 8, 13, 17, 7, 44, 62, 57, 85, 96, 100, 91, 42, 33

Challenge problem: try to reorder your binary search tree from part (3) so that the tree is more balanced. Recall that a balanced tree will have leaf nodes that are close to the same height.