Temasek Junior College

2023 JC2 H2 Computing

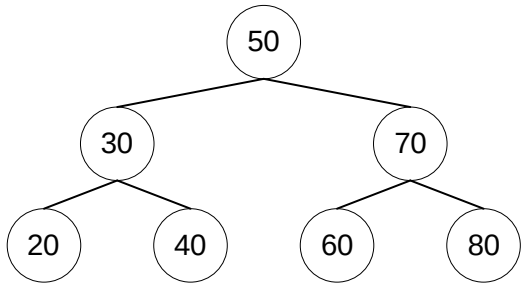
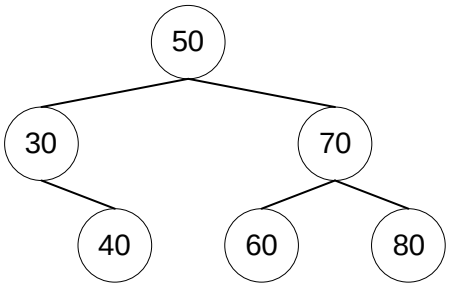
Data Structures 8: Binary Search Trees (Deletion)

1 Deletion of Nodes from a Binary Search Tree

When we delete a node, three possibilities arise.

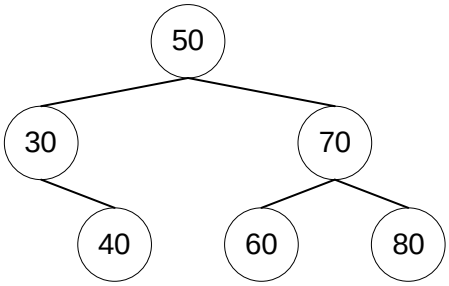
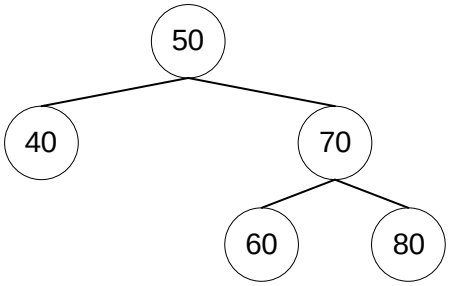
Case 1

Node to be deleted is the leaf: Simply remove from the tree.

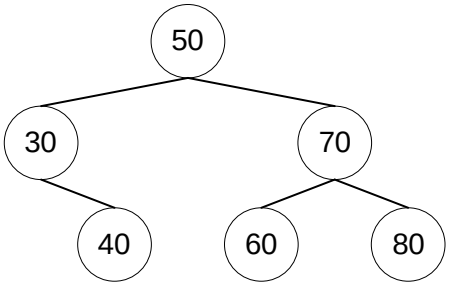
	
Before deletion	After deleting 20

Case 2

Node to be deleted has only 1 child: Copy the child to the node and delete the child

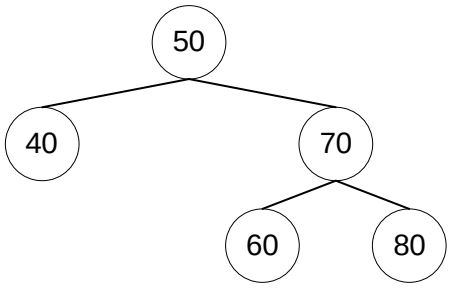
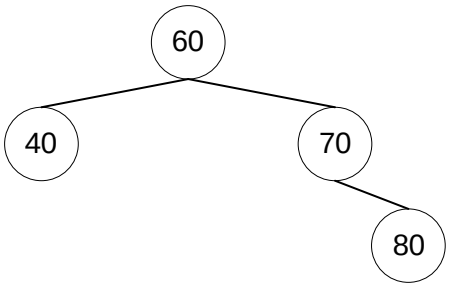
	
Before deletion	After deleting 30

Sketch the intermediate step for Case 2



Case 3

Node to be deleted has two children: Find the in-order successor of the node. Copy contents of the in-order successor to the node and delete the in-order successor. Note that the in-order predecessor can also be used.

	
Before deletion	After deleting 50

The important thing to note is, in-order successor is needed only when the right child is not empty. In this particular case, in-order successor can be obtained by finding the minimum value in the right child of the node.

Sketch the intermediate step for Case 3