DATA STRUCTURES AND ITS APPLICATIONS

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DATA STRUCTURES AND ITS APPLICATIONS

BST: Deletion Operations

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Binary Search Tree - Deletion

Deletion of a Node in Binary Search Tree

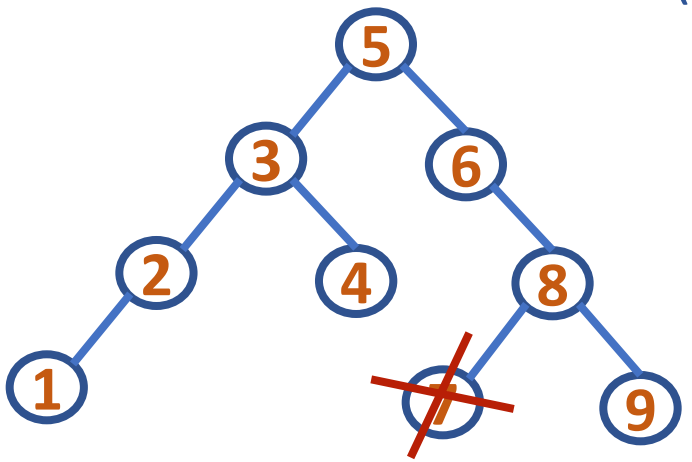
case1: Node with no child (leaf node)

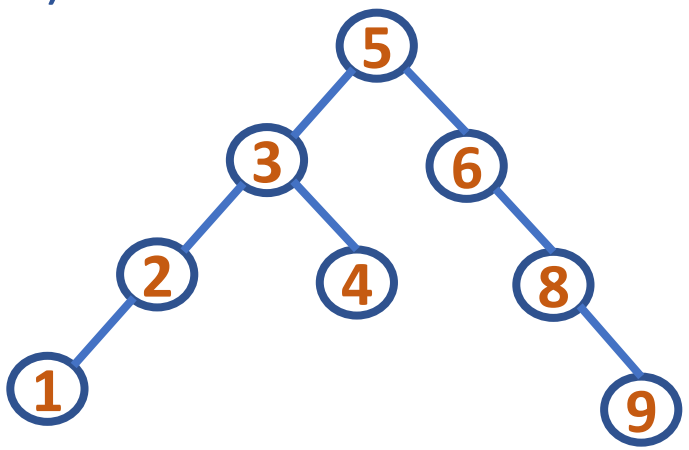
case2: Node with 1 child

case3: Node with 2 children

Binary Search Tree - Deletion

case1: Node with no child (leaf node)



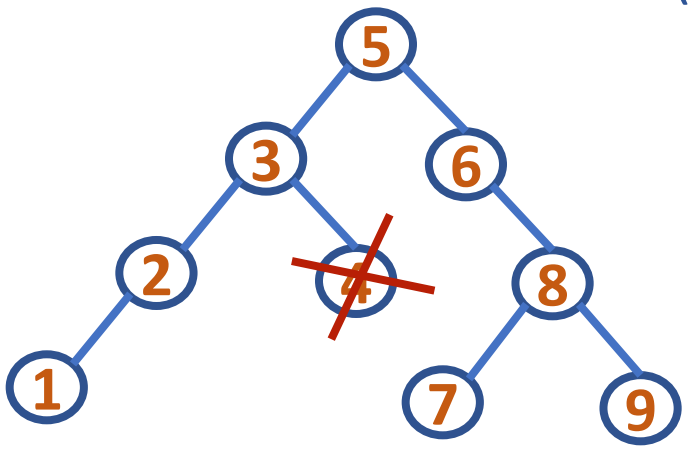


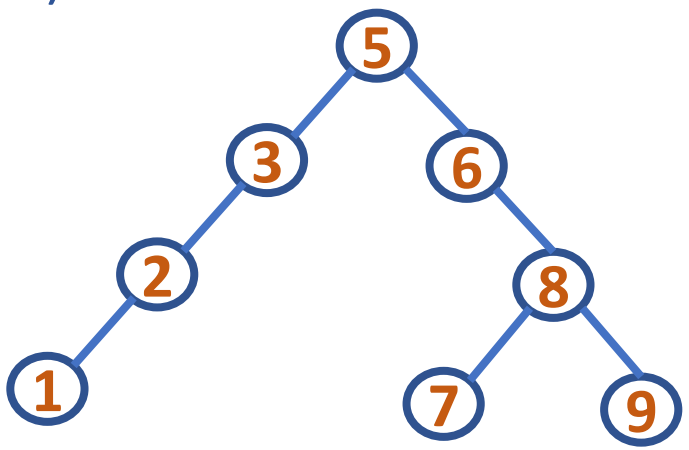
To delete the node with info 7:

- Set its parent's left child field to point to NULL
- Free memory allocated to node with info 7

Binary Search Tree - Deletion

case1: Node with no child (leaf node)



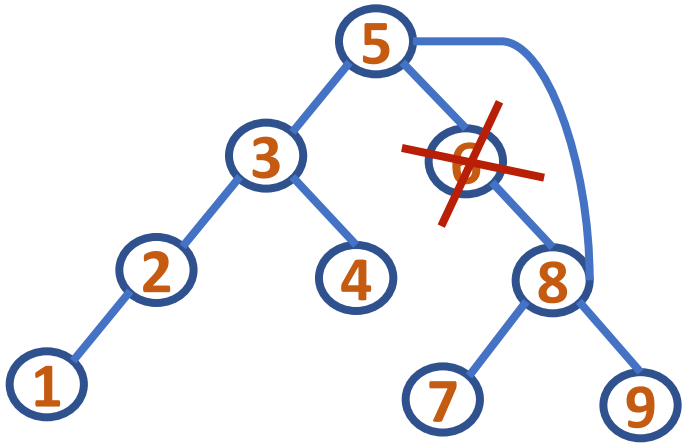


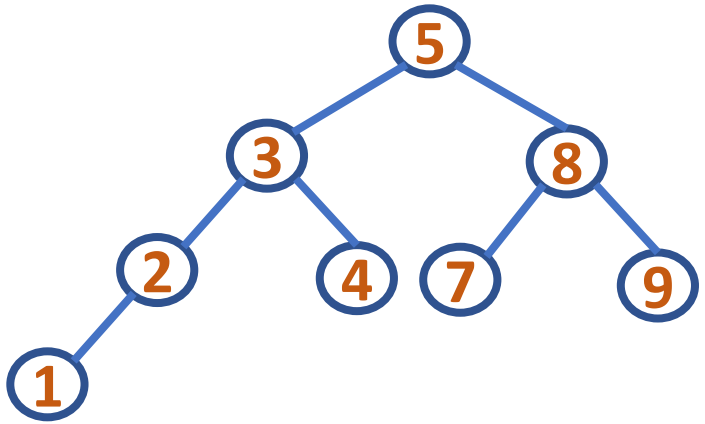
To delete the node with info 4:

- Set its parent's right child field to point to NULL
- Free memory allocated to node with info 4

Binary Search Tree - Deletion

case2: Node with 1 child



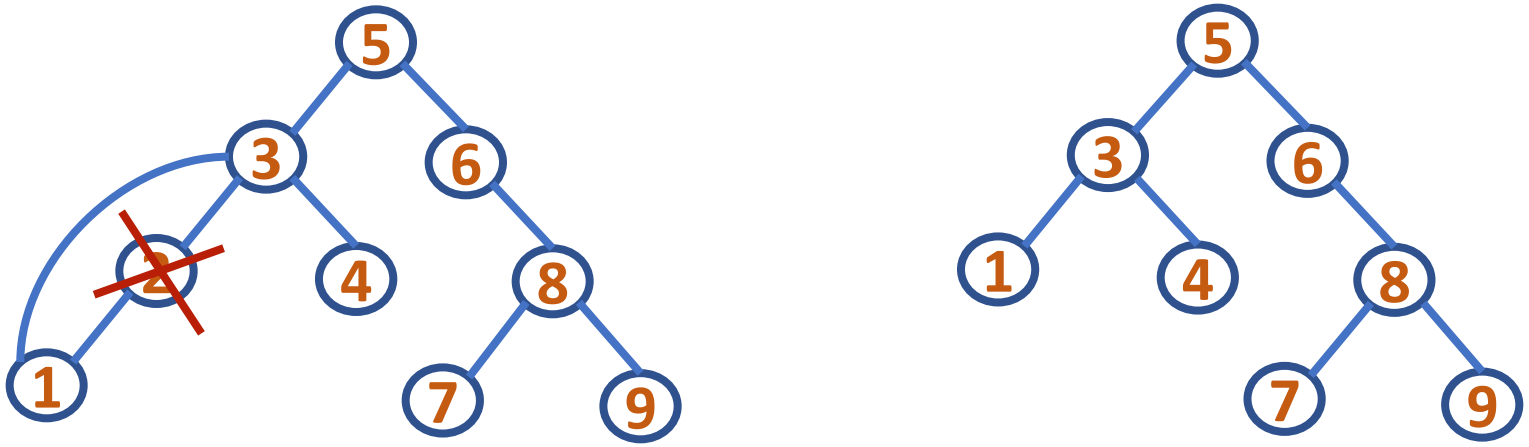


To delete the node with info 6:

- Set its parent's right child field to point to its only child
- Free memory allocated to node with info 6

Binary Search Tree - Deletion

case2: Node with 1 child

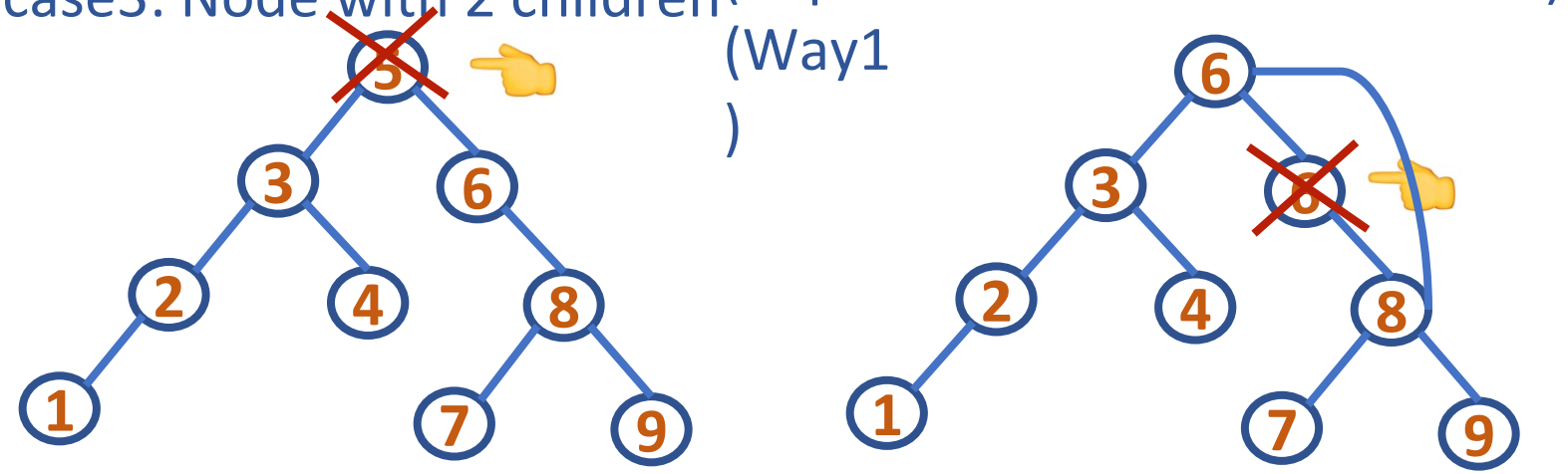


To delete the node with info 2:

- Set its parent's left child field to point to its only child
- Free memory allocated to node with info 2

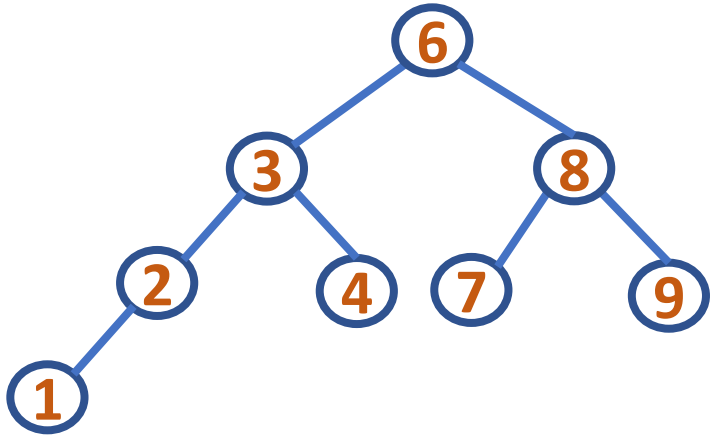
Binary Search Tree - Deletion

case3: Node with 2 children (Replace with inorder successor) (Way1)



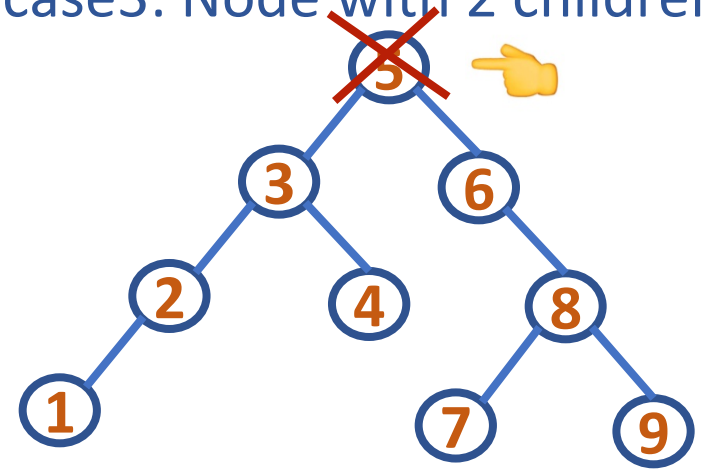
To delete the node with info 5:

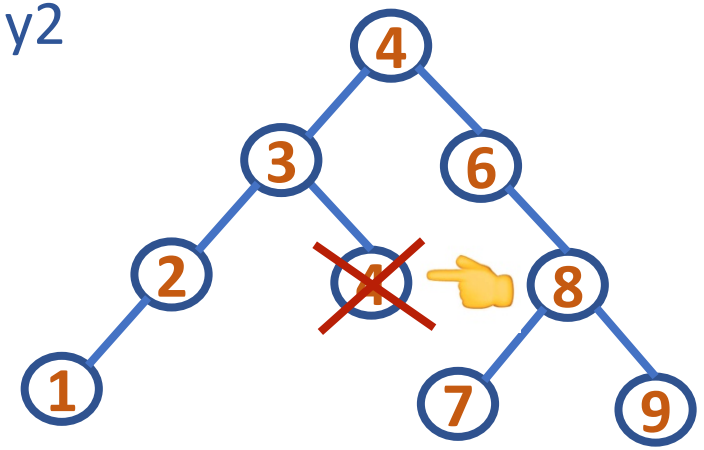
- Replace 5 with its **inorder successor** and delete that inorder successor
- Now case3 has got changed to case2 (In general may



Binary Search Tree - Deletion

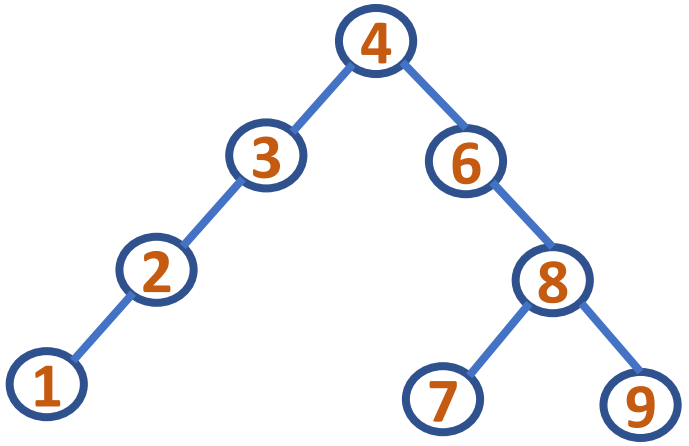
case3: Node with 2 children (Replace with inorder predecessor) (Way2)





To delete the node with info 5:

- Replace 5 with its **inorder predecessor** and delete that inorder predecessor
- Here case3 has got changed to case1 (In general may



1. In a Binary Search Tree (BST), deleting a leaf node requires:

A) Replacing it with its inorder predecessor
B) Replacing it with its inorder successor
C) Simply removing the node
D) Replacing it with the root node

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2. When deleting a node with only one child in a BST:

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C) Replace it with its child
D) Delete the entire subtree

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3. To delete a node with two children in a BST, we usually:

A) Replace it with the root node
B) Replace it with its inorder predecessor or successor
C) Replace it with any leaf node
D) Delete the entire subtree and rebuild

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4. Suppose we delete a node with two children and replace it with its inorder successor. The inorder successor is always found in the node's:

A) Left subtree
B) Right subtree
C) Root node
D) Either left or right subtree

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A) Left subtree

B) Right subtree

C) Root node

D) Either left or right subtree

THANK YOU

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