CSCE 221
Checkpoint 5 Revision

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QUESTION 2

1.

I didn't know what the BST ADT operations were so I guessed, After research I found that the operations are $\boxed{MakeEmpty,\ Find,\ FindMin,\ FindMax,\ Delete}$.

2.

If the BST is linear, it is a linked list so all operation assume $\boxed{O(N)}$ since they require iterating through every element.

3.

Each requires traversing a tree recursively so they would be $O(N)$.

4.

Since 1 is the smallest value and the tree is produced with a random permutation of elements, 1 would be at the bottom of the left most subtree of the root. Keep following the left child and eventually we will get to 1.

5.

Since N is the largest value and the tree is produced with a random permutation of elements, N would be at the bottom of the right most subtree of the root. Keep following the right child and eventually we will get to N.

6.

Since 4 is inserted first, $\boxed{4istheroot}$.

7.

Using

$$\frac{n+1}{2} \tag{1}$$

we have $\boxed{7}$ leaf nodes when n = 13.

8.

Solving for N,

$$I + \frac{N+1}{2} = N$$

$$2I + 1 = N,\ I = 12$$

$$\boxed{N = 25}$$

QUESTION 4

I did incorrect pointer reassignments. The correct deletions go as follows,

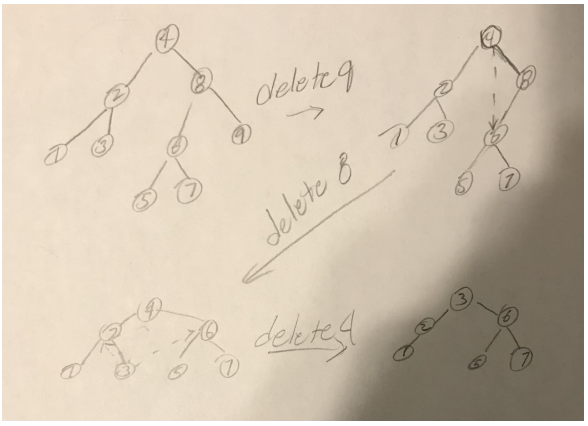

Fig. 1. Deletion sequence for given tree.

QUESTION 5

I guessed the meaning of each tree traversal, after finding out what these traversal orders mean, the following answers were reached,

1.

$$Preorder:\ RAVXBNE$$

2.

$$Postorder:\ XBVNAER$$

3.

$$Inorder:\ XVBANRE$$

4.

$$Levelorder:\ RAEVNXB$$