Insertion:

Draw the steps involved in inserting elements into a BST. Start with an empty tree and insert the following elements: 15, 10, 20, 8, 12, 17, 25

|  |  |  |
| --- | --- | --- |
| Step 1: Insert 15 |  | Root :15 |
| Step 2: Insert 10 |  | Insert 10, less than 15 so it is insert on the left |
| Step 3: Insert 20 |  | Insert 20  Start from top  More than 15, so insert on the right |
| Step 4: Insert 8 |  | Insert 8  Start from top  Less than 15 go left,  less than 10. Insert on the left |
| Step 5: Insert 12 |  | Insert 12  Start from top  Less than 15 go left,  more than 10  Insert on the right of 10 |
| Step 6: Insert 17 |  | Insert 17  Start from top,  More than 15 go right,  Less than 20, insert on the left |
| Step 7: Insert 25 |  | Insert 25  Start from top,  More than 15 go right,  More than 20, insert on the right |

Deletion

|  |  |  |
| --- | --- | --- |
| Delete a Leaf Node:  Delete any leaf node is simple as it is just deleting a leaf | Before: | After: |
| Delete a node with one child  Deleting 10 which have 1 children, would result to having 15 adopt to the next children, which is 12 | Before: | After: |
| Delete a node with two children  To delete 15 which has 2 children.  It would search for the least of the right tree (in-order successor) . So it would go right, and then left until the last number. Replace it, and delete 15 |  |  |