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Question 1: pseudo code for programming question 2

2a)

1. In driver function check to see if root = nullptr if true return false
2. Driver function return recursive function
3. In recursive function if the Object < current element return the function on the left
4. In recursive function if the current element < Object return the function on the right
5. If 3 & 4 are false return true
6. Last return start returns false

2b)

1. Driver function to call recursive function
2. In recursive function check to see if node that is passed in is = to nullptr
3. Check if t->element < low, if recursively call function with t->right
4. Check if t->element > high, if recursively call function with t->left
5. Check to if element is = to low or high, if true output element
6. Check to see if element is in range of low and high, if true out element
  - a. Recursively call on left and right

2c).

2d)

1. In driver function check to see if root is empty, if true return -1.
2. In driver function call recursive function / size()
  - a. I created the size function for this function
3. Check if the node passed in is = to nullptr is true return 0
4. Return function recursively on the right and left side adding them. Also add the dep variable to them.

Question 2: Big-Oh for programming question 2

2a)  $O(\log(n))$

2b)  $O(k)$  where k is the number of keys that is Executed.

2c)

2d)  $O(\log(n))$

Question 3:

The code works correctly

Question 4:

The code will run but there is an issue with the size. When the size is set to 1 in the new Node create then the size will get incremented again. The size should be 0 in the Node creation.

Question 5:

- a). 14,17,18,22,30
- b). 22,17,14,18,30
- c). 14, 18, 17, 30, 22