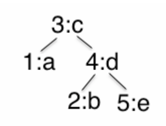
Course › 6a: Binary Search Trees › BSTs › Questions 1-5

Questions 1-5

Question 1

1/1 point (graded)

Is this a valid BST? Specifically, is it a binary tree that satisfies the BST invariants?



○ Yes

● No

✓

Explanation

Key 2 is in the right subtree of node 3:c, but 2 < 3, so the invariant for BSTs is not satisfied.

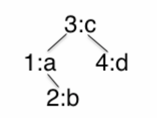
Submit

Answers are displayed within the problem

Question 2

1/1 point (graded)

Is this a valid BST?



● Yes

○ No

✓

Explanation

The invariant for BSTs holds over the entire tree.

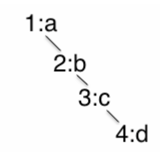
Submit

Answers are displayed within the problem

Question 3

1/1 point (graded)

Is this a valid BST?



● Yes

○ No

✓

Explanation

The invariant for BSTs holds over the entire tree.

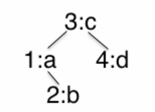
Submit

Answers are displayed within the problem

Question 4

1/1 point (graded)

How many nodes do we have to look at in this BST to find the node with key 4? Include the node with key 4 in your count.



2 ✓ **Answer:** 2

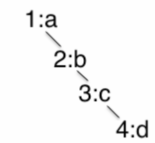
Explanation
First we look at the root, the node 3:c. It does not have the key 4. We go down the right subtree since the key we are looking for is greater than 3. Then we look at the node 4:d, and it has key 4 and we are done. So we looked at 2 nodes, 3:c and 4:d.

Submit

ℹ Answers are displayed within the problem

Question 5

1/1 point (graded)
How many nodes do we have to look at in this BST to find the node with key 4? Include the node with key 4 in your count.



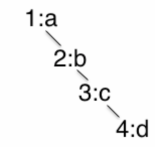
4 ✓ **Answer:** 4

Explanation
To find key 4, we need to look at nodes 1:a, 2:b, 3:c, and then 4:d. So 4 nodes in total.

Submit

ℹ Answers are displayed within the problem

Food for thought:



- If all binary search trees looked like the one above, will we gain anything from using them instead of lists?
- Can we do anything to those trees if we want to improve the performance of searching for a node?