

Feedback — Binary Search Trees

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You submitted this quiz on **Sun 27 Sep 2015 2:40 PM EDT**. You got a score of **2.60** out of **3.00**. You can [attempt again](#), if you'd like.

To specify an array or sequence of values in an answer, separate the values in the sequence by whitespace. For example, if the question asks for the first ten powers of two (starting at 1), then the following answer is acceptable:

1 2 4 8 16 32 64 128 256 512

If you wish to discuss a particular question and answer in the forums, please post the entire question and answer, including the seed (which can be used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

Question 1

(seed = 707982)

Give the level-order traversal of the BST that results after inserting the following sequence of keys into an initially empty BST:

73 42 79 97 70 74 51 38 32 46

Your answer should be a sequence of 10 integers, separated by whitespace.

You entered:

73 42 79 38 70 74 97 32 51 46

Your Answer	Score	Explanation
73 42 79 38 70 74 97 32 51 46	✓ 1.00	
Total	1.00 / 1.00	

Question Explanation

The correct answer is: 73 42 79 38 70 74 97 32 51 46

Here is the level-order traversal of the BST after each insertion:

```

73: 73
42: 73 42
79: 73 42 79
97: 73 42 79 97
70: 73 42 79 70 97
74: 73 42 79 70 74 97
51: 73 42 79 70 74 97 51
38: 73 42 79 38 70 74 97 51
32: 73 42 79 38 70 74 97 32 51
46: 73 42 79 38 70 74 97 32 51 46

```

Question 2

(seed = 398743)

Given a BST whose level-order traversal is:

```
69 33 95 26 41 94 98 11 46 73 96 52
```

What is the level-order traversal of the resulting BST after Hibbard deleting the following three keys?

```
96 94 33
```

Your answer should be a sequence of 9 integers, separated by whitespace.

You entered:

69 41 95 26 46 73 98 11 52

Your Answer	Score	Explanation
69 41 95 26 46 73 98 11 52	✓ 1.00	
Total	1.00 / 1.00	

Question Explanation

The correct answer is: 69 41 95 26 46 73 98 11 52

Here is the level-order traversal of the BST after each deletion:

96: 69 33 95 26 41 94 98 11 46 73 52

94: 69 33 95 26 41 73 98 11 46 52

33: 69 41 95 26 46 73 98 11 52

Question 3

(seed = 130629)

Which of the following statements about binary search and binary search trees are true? Check all that apply. Unless otherwise specified, assume that the binary search and binary search tree implementations are the one from lecture.

Your Answer	Score	Explanation
<input type="checkbox"/> Consider a BST containing N nodes that has height h. In the worst case, the number of key comparisons to determine the number of keys less than a given key is h+1.	✗ 0.00	This is the rank operation. In the worst case, there is one compare for each node on a path from the root to a leaf.

- ☐ ✓ 0.20 This would enable us to merge two sorted arrays using a logarithmic number of key compares. As in mergesort, this requires at least $\sim 2N$ key compares in the worst case.
- Given two BSTs, each containing N distinct keys, it is possible to create a single BST containing the $2N$ keys using a logarithmic number of key comparisons.
-
- ☒ ✓ 0.20 In the worst case, there is one compare for each node on a path from the root to a leaf.
- Consider a BST containing N nodes that has height h . In the worst case, the number of key compares to search for a key equals $h+1$.
-
- ☐ ✗ 0.00 It is possible because the keys satisfy symmetric order.
- Given either the preorder or postorder traversal of a BST containing N distinct keys, it is possible to reconstruct the shape of the BST.
-
- ☒ ✓ 0.20 This is the ceiling function.
- Given a sorted array of N distinct keys and a key x , it is possible to find the smallest key greater or equal to x in logarithmic time in the worst case.

Total 0.60 /
1.00

Question Explanation

