Feedback — Binary Search Trees

Help Center

You submitted this quiz on **Sun 27 Sep 2015 2:31 PM EDT**. You got a score of **2.40** 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 value
s in
the sequence by whitespace. For example, if the question asks for the firs
t
ten powers of two (starting at 1), then the following answer is acceptabl
e:

     1 2 4 8 16 32 64 128 256 512

If you wish to discuss a particular question and answer in the forums, ple
ase
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 (w
hich
contains the correct answer).
```

Question 1

```
(seed = 405515)
Give the level-order traversal of the BST that results after inserting
the following sequence of keys into an initially empty BST:

    30 73 67 74 32 85 93 48 58 76

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

You entered:

30 73 67 74 32 85 48 76 93 58

Your Answer		Score	Explanation
30 73 67 74 32 85 48 76 93 58	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 30 73 67 74 32 85 48 76 93 58

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

30:  30
73:  30 73
67:  30 73 67
74:  30 73 67 74
32:  30 73 67 74 32
85:  30 73 67 74 32 85
93:  30 73 67 74 32 85 93
48:  30 73 67 74 32 85 48 93
58:  30 73 67 74 32 85 48 93 58
76:  30 73 67 74 32 85 48 76 93 58
```

Question 2

```
(seed = 191361)
Given a BST whose level-order traversal is:

    74 55 96 13 70 95 32 63 94 54 56 91

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

    54 95 55

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

You entered:

74 56 96 13 70 94 32 63 91

Your Answer		Score	Explanation
74 56 96 13 70 94 32 63 91	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 74 56 96 13 70 94 32 63 91

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

54:  74 55 96 13 70 95 32 63 94 56 91
95:  74 55 96 13 70 94 32 63 91 56
55:  74 56 96 13 70 94 32 63 91
```

Question 3

```
(seed = 952880)
Which of the following statements about binary search and binary search tre
es are true? Check all that apply. Unless otherwise specified, assume that
the binary search and binary search tree implementations are the one from l
ecture.
```

Your Answer		Score	Explanation
☑ Consider a node x in a BST. Then, the successor of x (the node containing the next largest key) is the leftmost node in the right subtree of x.	✖	0.00	The successor can be the parent of x (if x is the left child of its parent and x has no right child).

☐ No compare-based algorithm can construct a BST from a sequence of N distinct keys in fewer than lg (N!) ~ N lg N key compares in the worst case.	✖	0.00	If it could, it would violate the ~ N lg N sorting lower bound because an inorder traversal (which takes linear time) gives the keys in sorted order.
☑ Given a sorted array containing N distinct keys and a BST containing the same N keys, then the worst-case number of key compares to search for a key in the BST is greater than or equal to the worst-case number of key compares to binary search for a key in the sorted array.	✔	0.20	In the worst case, the number of key compares to binary search for a key in a sorted array is ~ lg N. The height of any BST on N keys is at least ~ lg N, so searching for a key in a BST takes at least ~ lg N compares in the worst case.
☑ The expected number of key compares to insert N distinct keys in random order into an initially empty BST is ~ 2 N ln N.	✔	0.20	This is a fundamental property of random BSTs.
☑ Consider a BST	✖	0.00	This is the selection operation. It takes time proportional to the height, but no key compares are needed.

containing N no
des that has he
ight h. In the
worst case, the
number of key c
ompares to find
a median key is
h+1.

Total	0.40 / 1.00

Question Explanation