CSCI 2270 - Zagrodzki, Ashraf, Trivedi - CS2: Data Structures

Started on	Sunday, 8 March 2020, 8:53 PM
State	Finished
Completed on	Sunday, 8 March 2020, 9:08 PM
Time taken	15 mins 30 secs
Grade	**4.10** out of 10.00 (**41**%)

Question **1**

Correct

Mark 1.00 out of 1.00

```
What is the postorder traversal for this tree?
(use spaces to separate numbers in the answer)
```

```
              7
            /     \
          5         9
        /  \       /  \
      12    6    8     1
           /  \        /
         10    2      3
```

Answer: 12 10 2 6 5 8 3 1 9 7   ✔

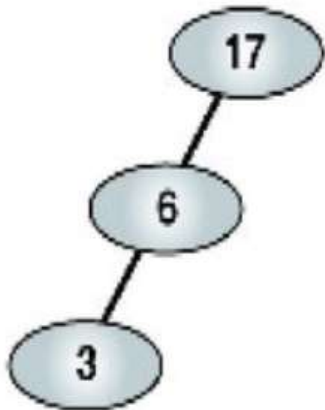The correct answer is: 12 10 2 6 5 8 3 1 9 7
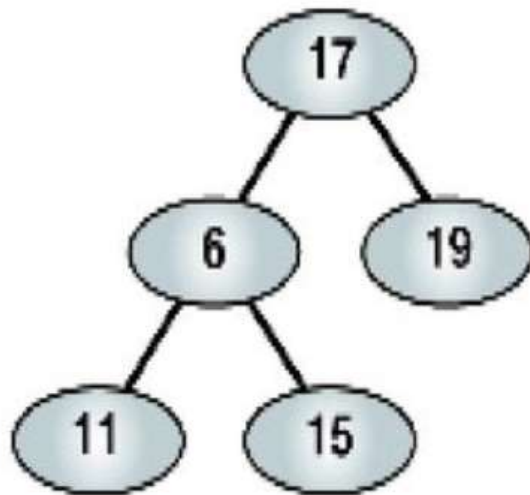
Question **2**

Incorrect

Mark 0.00 out of 1.00

Which of the following is NOT a valid binary search tree?

Select one:

○ 17

◉ 17 — 6 — 3 ✗

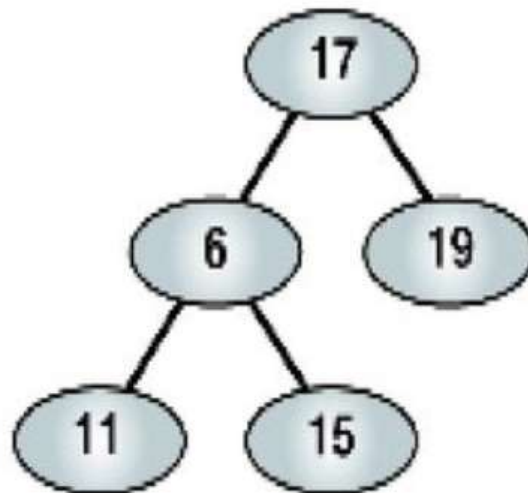○ 17 with children 6 and 19; 6 with children 3 and 14

○
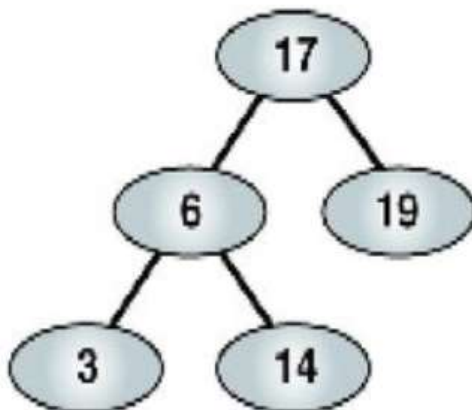
Your answer is incorrect.

The correct answer is:

Question **3**

Correct

Mark 1.00 out of 1.00

In a BST, basic operations to search, insert, and delete run in O(h) time, where h is the height of the tree. In the worst case, where n is the number of nodes, these operations are O(n) and the BST has the same runtime properties as a linked list. When the tree is balanced, the distance from the root to any leaf node at the bottom of the tree, is log(n), where n is the number of nodes in the tree. Hence the complexity to search in a balanced binary tree is _____.

Select one:

○   a. O(n)

◉   b. O(log n)   ✔

○   c. $O(n^2)$

○   d. $O(2^n)$

○   e. None of these

> Your answer is correct.
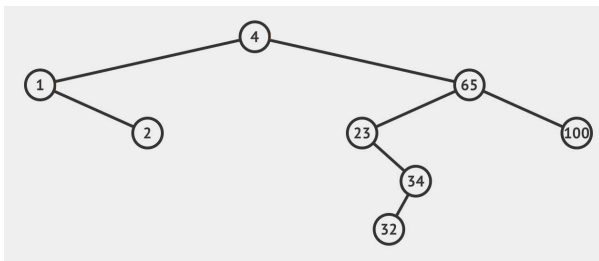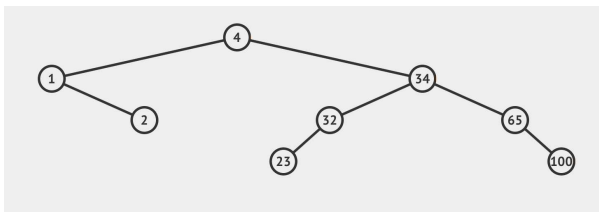>
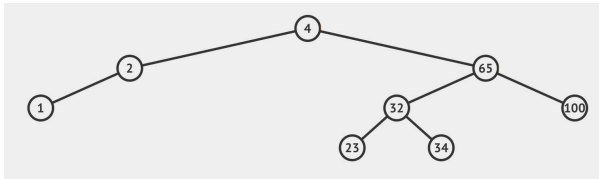> The correct answer is: O(log n)
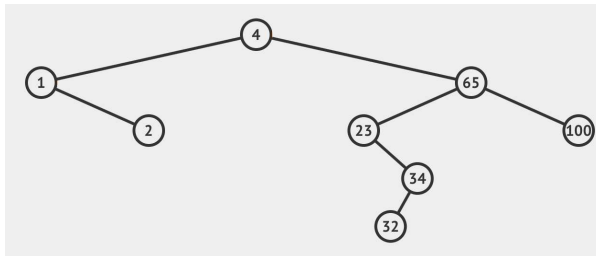
Question **4**

Incorrect

Mark 0.00 out of 1.00

For the following array of integers, build a BST. What does the final tree look like?

Nodes are inserted by the order [4, 65, 23, 34, 1, 32, 100, 2] .

Select one:

Your answer is incorrect.

The correct answer is:

Question **5**

Partially correct

Mark 0.60 out of 2.00

The following recursive function is called to adjust the structure of a Binary search tree

```
void change(struct Node* node)
{
    if (node == NULL)
        return;
    else
    {
        struct Node* temp;

        change(node->left);
        change(node->right);

        temp = node->left;
        node->left = node->right;
        node->right = temp;

    }
}
```

```
Consider following binary search tree:
```

```
      4
    /   \
   2     7
  / \   / \
 1   3 6   9
```

Before we call this function, postorder traversal of this tree is

```
1 3 2 6 9 7 4
```

✔

Then , the following code is called:

```
change(root);
```

Root is a pointer to the TreeNode whose key is 4.

After we called this function, postorder traversal of this tree is

```
3 1 7 9 7 2 4
```

✖

Enter the node value by your traversal. There is a **single space** between values.

Note, there are no intended errors in the code.

> Your answer is partially correct.
>
> 1 of your answers is correct.

Question **6**

Partially correct

Mark 0.50 out of 1.00

When deleteing a node(N) in a BST and N has both left and right child, what values of the following can be used to replace the target node(N)'s value?

Select one or more:

☐ the smalleing node in the left subtree of N

☐ the largest node in the right subtree of N

☐ the largest node in the left subtree of N

☑ the smallest node in the right subtree of N ✔

> Your answer is partially correct.
>
> You have correctly selected 1.
> The correct answers are: the largest node in the left subtree of N, the smallest node in the right subtree of N

Question **7**

Correct

Mark 1.00 out of 1.00

When inserting a new node into a Binary Search Tree, the new node is always a leaf node.

Select one:
◉ True ✔
○ False

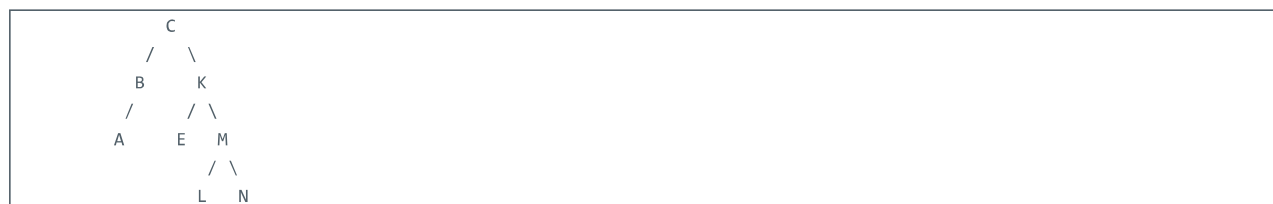> *We note that a new node is always inserted as a leaf node. --- Check the recitation write-up.*
>
> The correct answer is 'True'.

Question **8**

Incorrect

Mark 0.00 out of 1.00

Consider the following BST:

```
            C
          /   \
         B      K
        /      / \
       A      E   M
                 / \
                L   N
```

Choose correct inorder traversal for the tree after deleting node K from the tree. Consider lexicographical ordering among the letters.

Select one:

○ a. ABCLEMN

◉ b. ABENMLC   ✖

○ c. CBALEMN

○ d. ABCELMN

○ e. None of these

Your answer is incorrect.

The correct answer is: ABCELMN

Question **9**

Incorrect

Mark 0.00 out of 1.00

Which of the following may be the inorder traversal of a BST? Select all that apply.

Select one or more:

☐ None of them

☐ 2, 6, 5, 11,13,22,34

☐ 2,6,10,15,30,55,80

☑ All of them ✖

☐ 1,7,11,22,25,31,46

☐ 30,22,17,14,9,6,0

Your answer is incorrect.

The correct answers are: 2,6,10,15,30,55,80, 1,7,11,22,25,31,46