CCSF *Insight*

CS-111C-META-Data Structures & Algo: Java-Masters-Spring 2017

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Started on	Monday, May 1, 2017, 4:00 PM
State	Finished
Completed on	Monday, May 1, 2017, 9:06 PM
Time taken	5 hours 5 mins
Grade	**89.00** out of 100.00

Question 1

Correct

1.00 points out of 1.00

⚑ Flag question

A binary tree has 5 levels.

(The root is level 1, the root's children are level 2, etc.)

What is the maximum number of **nodes** in the tree?

Answer: 31 ✓

The correct answer is: 31

Question 2

Correct

1.00 points out of 1.00

⚑ Flag question

A binary tree has 5 levels.

(The root is level 1, the root's children are level 2, etc.)

What is the maximum number of **leaves** in the tree?

Answer: 16 ✓

The correct answer is: 16

Question 3

Correct

1.00 points out of 1.00

⚑ Flag question

A binary tree has 6 levels.

(The root is level 1, the root's children are level 2, etc.)

What is the maximum number of **nodes** in the tree?

Answer: 63 ✓

The correct answer is: 63

Question 4

Correct

1.00 points out of 1.00

⚑ Flag question

A binary tree has 6 levels.

(The root is level 1, the root's children are level 2, etc.)

What is the maximum number of **leaves** in the tree?

Answer: 32 ✓

The correct answer is: 32

Information

⚑ Flag question

Use the tree below for the next two questions.
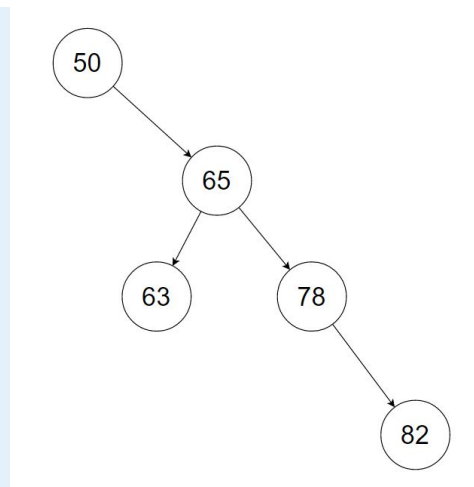
Question 5

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary tree?

Select one:

⦿ Yes ✓

◯ No

Your answer is correct.

The correct answer is: Yes

Question 6

Complete

2.00 points out of 2.00

⚑ Flag question

Briefly explain why or why not.

Each node has at most two children. None of the nodes shown here have more than two children.

Comment:

Question 7

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary search tree?

Select one:

⦿ Yes ✓

◯ No

Your answer is correct.

The correct answer is: Yes

Question 8

Complete

2.00 points out of 2.00

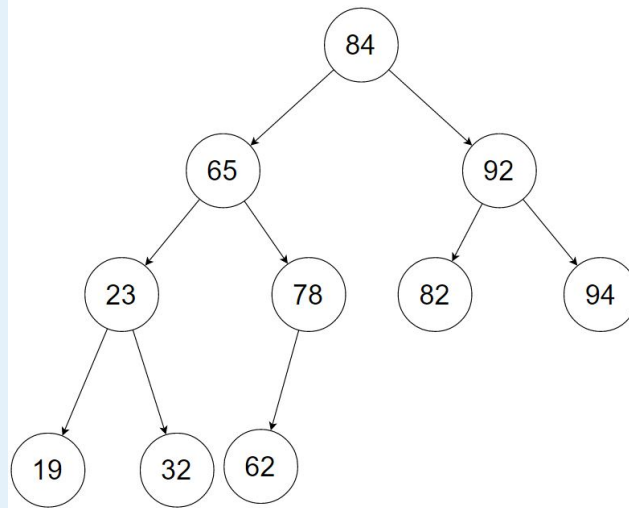⚑ Flag question

Briefly explain why or why not.

Yes, because all the data on the left subtree of a node is less than the node and all the data on the right subtree of a node is greater than the node. In addition, the inorder traversal of the tree would give 50, 63, 65, 78, 82 which is the order of the numbers from least to greatest.

Comment:

Information

⚑ Flag question

Use the tree below for the next two questions.

Question 9

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary tree?

Select one:
- ⊙ Yes ✓
- ○ No

Your answer is correct.

The correct answer is: Yes

Question 10

Complete

2.00 points out of 2.00

⚑ Flag question

Briefly explain why or why not.

Each node has at most two children. None of the nodes shown here have more than two children.

Comment:

Question 11

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary search tree?

Select one:
- ○ Yes
- ⊙ No ✓

Your answer is correct.

The correct answer is: No

Question 12

Complete

2.00 points out of 2.00

⚑ Flag question

Briefly explain why or why not.

No, because 62 is to the right of 65, but 62 < 65 & 82 is to the right of 84, but 82 < 84.
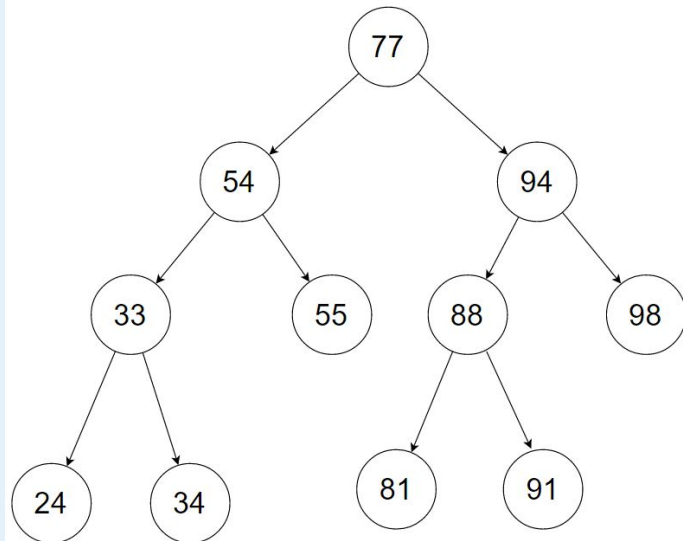
In addition, the inorder traversal of the tree would give 19, 23, 32, 65, 62, 78, 84, 82, 92, 94 which is not in order from least to greatest.

Comment:

Information

⚑ Flag question

Use the tree below for the next two questions.

```
                          ( 77 )
                         /      \
                   ( 54 )        ( 94 )
                   /    \        /    \
               ( 33 ) ( 55 )  ( 88 ) ( 98 )
               /   \          /   \
           ( 24 ) ( 34 )   ( 81 ) ( 91 )
```

Question 13

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary tree?

Select one:

🔘 Yes ✔

⚪ No

Your answer is correct.

The correct answer is: Yes

Question 14

Complete

2.00 points out of 2.00

⚑ Flag question

Briefly explain why or why not.

Each node has at most two children. None of the nodes shown here have more than two children.

Comment:

Question 15

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree a binary search tree?

Select one:

🔘 Yes ✔

⚪ No

Your answer is correct.

The correct answer is: Yes

Question 16

Complete

2.00 points out of 2.00

⚑ Flag question

Briefly explain why or why not.

Yes, because all the data on the left subtree of a node is less than the node and all the data on the right subtree of a node is greater than the node. In addition, the inorder traversal of the tree would give 24, 33, 34, 54, 55, 77, 81, 88, 91, 94, 98 which is the order of the numbers from least to greatest.

Comment:

Information

🏳 Flag question

Use the tree below for the next three questions.
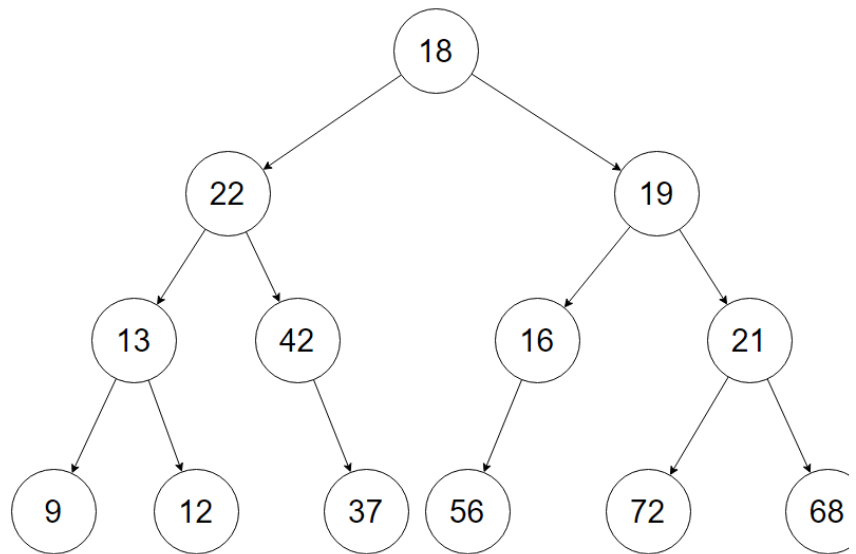
Question 17

Correct

6.00 points out of 6.00

🏳 Flag question

What is the **preorder** traversal of the binary tree?

To list the traversal, list each value visited separated by a comma and space (e.g., 18, 22, 19...).

Answer: 18, 22, 13, 9, 12, 42, 37, 19, 16, 56, 21, 72, 68   ✔

The correct answer is: 18, 22, 13, 9, 12, 42, 37, 19, 16, 56, 21, 72, 68

Question 18

Correct

6.00 points out of 6.00

🏳 Flag question

What is the **postorder** traversal of the binary tree?

To list the traversal, list each value visited separated by a comma and space (e.g., 18, 22, 19...).

Answer: 9, 12, 13, 37, 42, 22, 56, 16, 72, 68, 21,19, 18   ✘

The correct answer is: 9, 12, 13, 37, 42, 22, 56, 16, 72, 68, 21, 19, 18

Comment:

Terrible spacing!

"9, 12, 13, 37, 42, 22, 56, 16, 72, 68, 21,19, 18"

just kidding...

Question 19

Correct

6.00 points out of 6.00

🏳 Flag question

What is the **inorder** traversal of the binary tree?

To list the traversal, list each value visited separated by a comma and space (e.g., 18, 22, 19...).

Answer: 9, 13, 12, 22, 42, 37, 18, 56, 16, 19, 72, 21, 68   ✔

The correct answer is: 9, 13, 12, 22, 42, 37, 18, 56, 16, 19, 72, 21, 68

Question 20

Complete

6.00 points out of 6.00

⚑ Flag question

Draw the **binary search tree** that results from adding the following numbers **in this order.**

> 13, 9, 10, 15, 21, 14, 19, 12, 11, 4

W⃞ Binary Tree .docx

Comment:

Question 21

Correct

1.00 points out of 1.00

⚑ Flag question

Is the binary search tree you drew above unique?

In other words, is this the **only possible** binary search tree for the numbers inserted in this order?

Select one:

◉ Yes ✓

◯ No

Your answer is correct.

The correct answer is: Yes

Question 22

Complete

8.00 points out of 8.00

⚑ Flag question

Give an insertion order of the elements below that would result in the **most balanced binary search tree**.

Submit the ordering **and** a drawing of the tree.

> 3, 6, 9, 10, 12, 14, 16, 19, 24, 27

12, 9, 10, 6, 3, 19, 16, 14, 24, 27

⚙ Untitled.tiff

Comment:

Question 23

Correct

1.00 points out of 1.00

⚑ Flag question

Is the tree you drew above unique?

In other words, is this the **only possible** more balanced binary search trees for these numbers?

Select one:

◯ Yes

◉ No ✓

Your answer is correct.

The correct answer is: No

Question 24

Complete

8.00 points out of 8.00

⚑ Flag question

Give an insertion order of the elements below that would result in the **least balanced binary search tree**.

Submit the ordering **and** a drawing of the tree.

> 4, 5, 6, 8, 10, 12, 14, 15, 16, 17

4, 5, 6, 8, 10, 12, 14, 15, 16, 17

⚙ Untitled.tiff

Comment:

Question 25

Incorrect

0.00 points out of 1.00

⚑ Flag question

Is the tree you drew above unique?

In other words, is this the **only possible** least balanced binary search trees for these numbers?

Select one:

◉ Yes ✗   The answer is not unique. This is not the **only** possible binary search tree with the same height.

◯ No

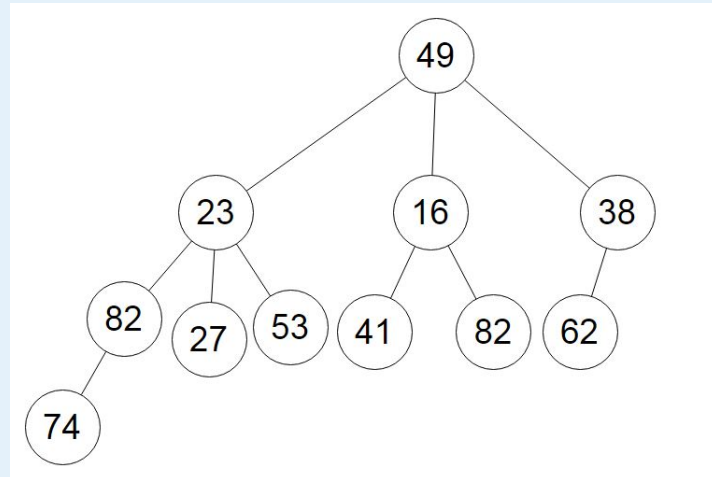Your answer is incorrect.

The correct answer is: No

Question 26

Complete

10.00 points out of 10.00

⚑ Flag question

Draw the binary tree that represents the general tree below.

Use the algorithm from the textbook (Section 24.19), which is also contained in the online notes.
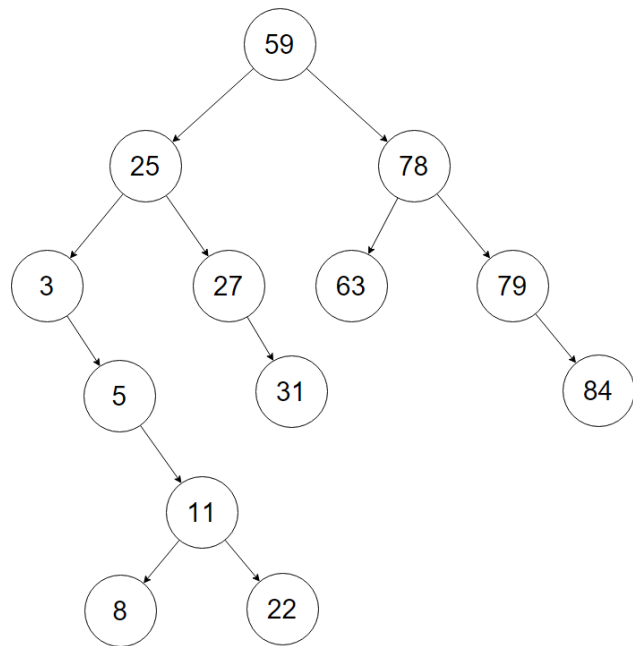

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Comment:

Question 27

Complete

10.00 points out of 10.00

⚑ Flag question

Remove the element 25 from the binary search tree below. Remove 25 from the tree in two different ways. Submit a drawing of **each** tree.

Use the two algorithms from the textbook (Section 25.22), which are also contained in the online notes. Make sure that the tree with 25 removed is still a valid binary search tree.

🌸 Untitled.tiff

Comment:

Question 28

Complete

5.00 points out of 5.00

⚑ Flag question

Use pseudocode to describe how you would find the minimum value in a binary search tree.

```
public int minimumValue(Node root){
    Node currentNode = root

    int minValue

    while(currentNode.left != null){

        currentNode = currentNode.left

    }

    minValue = currentNode.data

    return minValue

}
```

Comment:

Question 29

Not answered

Points out of 10.00

⚑ Flag question

Write a **recursive** method for the class BinaryTree that counts the number of times an object occurs in a tree. (Note that this method is just for binary trees- not a more specific kind of tree.)

The method header is:

    public int count(T anObject)

Hint: write a private helper method: countHelper(BinaryNodeInterface<T> node, object) and review the BinaryTree class to review the instance variables provided. The code in segment 24.10 might be helpful.

Finish review

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