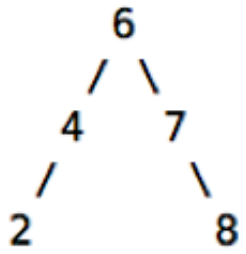
Review Test Submission: Week 08 Quiz

User	Dong Gao
Subject	Algorithms and Complexity
Test	Week 08 Quiz
Started	2/05/16 3:54 PM
Submitted	2/05/16 3:54 PM
Due Date	8/05/16 11:59 PM
Status	Completed
Attempt Score	4 out of 4 points
Time Elapsed	0 minute
Instructions	You should attempt the quiz after the lecture and your tutorial. • The quiz is available for a period of 10 days. • You may attempt the quiz multiple times (if you happen to get a question wrong, you can do it again) • Your score on the quiz will be recorded in the grade book. The score is not used when determining your final mark in this subject • The quiz might not display equations correctly in some browsers. If you experience problems, we recommend that you use Firefox. **Note:** you must complete at least eight of the weekly quizzes to meet one of the hurdle requirements in this subject.
Results Displayed	All Answers, Submitted Answers, Feedback, Incorrectly Answered Questions

Question 1

1 out of 1 points

The keys 2, 4, 6, 7, and 8 have been inserted, one by one, in some unknown order, into an initially empty BST. The result is this BST:



There are 120 different permutations of the five keys, but not all of these would lead to this particular BST being built. How many of the permutations will generate this particular BST?

Selected Answer: 6

Response Feedback: Yes, there are six permutations, namely 6 4 7 8 2, 6 4 2 7 8, 6 4 7 2 8, 6 7 4 8 2, 6 7 4 2 8, and 6 7 8 4 2.

Question 2

1 out of 1 points

How many different binary search trees (BSTs) with elements {1,2,3,4} are there? And how many with elements {1,2,3,4,5}?

Selected Answer: b. 14 and 42, respectively

Answers:

a. 24 and 120, respectively

b. 14 and 42, respectively

c. 16 and 25, respectively

d. 14 and 72, respectively

e. 10 and 24, respectively

Response Feedback: Correct! It is easy to see that there are 5 different BSTs with elements {1,2,3}. Now for {1,2,3,4}, there are 5 BSTs with root 1 (because there are 5 BSTs with elements {2,3,4}). Similarly there are 5 with root 4. There can only be 2 with root 2, because the left subtree has only 1 in it, and the right subtree has {2,3}. Similarly there are 2 with root 3, for a total of 14. So we have:

B(0) = 1 (1 empty BST)
B(1) = 1 (1 BST with 1 element)
B(2) = 2 (2 BSTs with 2 elements)
B(3) = 5 (5 BSTs with 3 elements)
B(4) = 14 (namely 5 + 2 + 2 + 5)

More generally, B(n+1) = B(0)B(n) + B(1)B(n-1) + B(2)B(n-2) + ... + B(n-2)B(2) + B(n-1)B(1) + B(n)B(0). Why?

Question 3

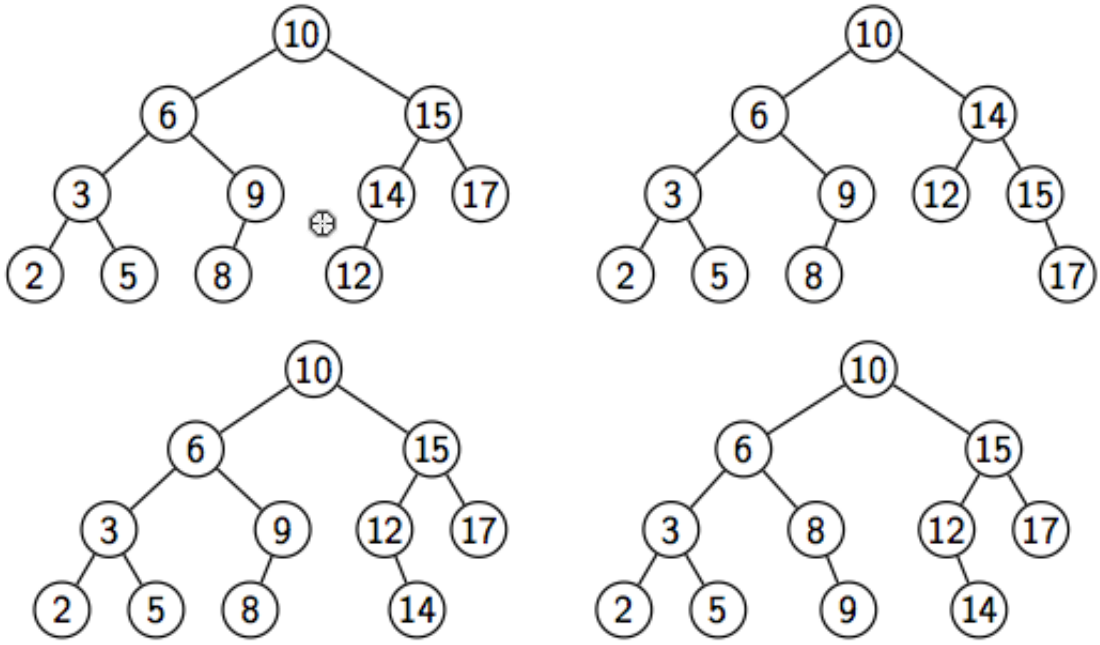
1 out of 1 points

Click the AVL tree that results when 5, 3, 2, 6, 8, 9, 10, 17, 15, 14, 12 are inserted, in that order, into an initially empty tree.

Selected Answer: 160, 126

Answers:

Student Response



Response Feedback: Yes, that's the right one. Note that all four options are valid AVL trees.

Question 4

1 out of 1 points

An AVL tree is constructed by inserting the following numbers in this order: 1, 7, 2, 6, 3, 5, 4. The in-, pre- and post-order traversals of the resulting tree are:

Selected Answer:
In-order: 1, 2, 3, 4, 5, 6, 7
Pre-order: 3, 2, 1, 6, 5, 4, 7
c. Post-order: 1, 2, 4, 5, 7, 6, 3

Answers:

In-order: 1, 2, 3, 4, 5, 6, 7
Pre-order: 4, 2, 1, 3, 6, 5, 7
a. Post-order: 1, 3, 2, 5, 7, 6, 4

In-order: 5, 1, 3, 4, 6, 7, 2
Pre-order: 6, 1, 5, 3, 4, 7, 2
b. Post-order: 5, 4, 3, 1, 2, 7, 6

In-order: 1, 2, 3, 4, 5, 6, 7
Pre-order: 3, 2, 1, 6, 5, 4, 7
c. Post-order: 1, 2, 4, 5, 7, 6, 3

In-order: 1, 2, 3, 4, 5, 6, 7
Pre-order: 2, 1, 6, 3, 4, 5, 7
d. Post-order: 1, 4, 5, 3, 7, 6, 2

e. None of the above

Response Feedback: Yes, well done.

Saturday, 4 June 2016 11:16:53 PM EST

← OK