NetID: xinruiy2 QuizID: 90459 Score: 5 / 5 Answer Source: PrairieLearn

1. Consider the Binary Search Tree built by inserting the following sequence of integers, one at a time, in the given order.

`5, 4, 7, 9, 8, 3, 1`

If a new node with a key of `6` is inserted in this BST, where would it be positioned?

A. as the left child of â€˜9â€™
B. [Correct Answer] [Your Answer] as the left child of `7`
C. as the right child of â€˜5â€™
D. as the right child of `4`
E. as the left child of â€˜8â€™

2. Choose the appropriate running time from the list below.

The variable *n* represents the number of items (keys, data, or key/data pairs) in the structure. In answering this question you should assume the best possible implementation given the constraints, and also assume that every array is sufficiently large to handle all items (unless otherwise stated).

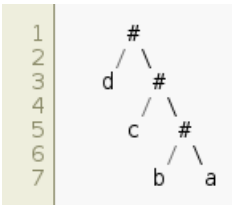
Worst case for finding a key in a Binary Search Tree (not necessarily AVL).

A. $O(\log n)$
B. $O(n \log n)$
C. $O(1)$
D. $O(n^2)$
E. [Correct Answer] [Your Answer] $O(n)$

3. Which of the following **CANNOT** be a valid sequence of nodes from the root to a leaf of a `binary search tree`?

A. None of the options is correct.
B. [Correct Answer] [Your Answer] `995, 353, 254, 498, 223`
C. `15, 982, 178, 645, 207, 517, 208, 223`
D. `128, 735, 209, 245, 223`
E. `492, 125, 418, 197, 223`

4. Given the following Huffman code: `0101101010111`, and the following Huffman tree:



What is the coded message (notice that the tree branches have not been denoted as `0` or `1`)?

A. `c d b c c d` or `d c b c c a`
B. `c c d c c c d d` or `c d b c c d`
C. [Correct Answer] [Your Answer] `d c b c c a` or `c c d c c c d d`
D. `d c b c c a`
E. `c c d c c c d d`
F. `c d b c c d`

5. Choose the appropriate running time from the list below.

The variable *n* represents the number of items (keys, data, or key/data pairs) in the structure. In answering this question you should assume the best possible implementation given the constraints, and also assume that every array is sufficiently large to handle all items (unless otherwise stated).

Compute the height of every subtree in a Binary Search Tree.

A. $O(n^2)$
B. $O(\log n)$
C. $O(1)$
D. [Correct Answer] [Your Answer] $O(n)$
E. $O(n \log n)$