NetID: xinran2 QuizID: 97029 Score: 1 / 5 Answer Source: PrairieLearn

1. 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).

Insert a key into a Binary Search Tree (not necessarily AVL)

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

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).

Build a BST with keys that are the numbers between 0 and n, in that order, by repeated insertions into the tree.

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

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

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

4. Given the following string of characters:

```
a b a a c c d e f f e a a d c e c
```

which character will possibly have the Huffman code `00`?

A. [Your Answer] `f`
B. [Correct Answer] `a`
C. None of these options can possibly have a Huffman code `00`
D. `b`
E. `d`

5. 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 `10` is inserted in this BST, where would it be positioned?

A. as the right child of â€˜7â€™
B. as the left child of â€˜8â€™
C. as the left child of â€˜11â€™
D. [Correct Answer] [Your Answer] as the right child of `9`
E. as the right child of `8`