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

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 time to find the In Order Successor of a given key in a Binary Search Tree (if it exists).

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

3. Suppose that we have numbers between 1 and 1000 in a `binary search tree` and we want to search for the number 363. Which of the following sequences **CANNOT** be the sequence of nodes visited in the search?

A. [Correct Answer] [Your Answer] `2, 399, 387, 219, 266, 382, 381, 278, 401`
B. `935, 278, 347, 621, 399, 392, 358, 363`
C. `2, 252, 401, 398, 330, 344, 397, 363`
D. `925, 202, 911, 240, 910, 245, 363`
E. `924, 220, 911, 244, 898, 258, 362, 389`

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

```
4, 5, 6, 7, 1, 2, 3
```

How many nodes have **two non-NULL** children in the tree produced?

A. `4`
B. We do not have enough information to answer the question.
C. `2`
D. [Correct Answer] [Your Answer] `1`
E. `3`

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).

Worst case for removal from a Binary Search Tree (not necessarily AVL).

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