Interview Questions (optional)

3/3 points earned (100%)

Excellent!

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1 / 1 points

1.
Red–black BST with no extra memory. Describe how to save the memory for storing the color information when implementing a red–black BST.

Note: these interview questions are ungraded and purely for your own enrichment. To get a hint, submit a solution.

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Thank you for your response.

Hint: modify the structure of the BST to encode the color information.

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1 / 1 points

2.

Document search. Design an algorithm that takes a sequence of n document words and a sequence of m query words and find the shortest interval in which the m query words appear in the document in the order given. The length of an interval is the number of words in that interval.

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Thank you for your response.

Hint: for each word, maintain a sorted list of the indices in the document in which that word appears. Scan through the sorted lists of the query words in a judicious manner.

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1 / 1 points

3.

Generalized queue. Design a generalized queue data type that supports all of the following operations in logarithmic time (or better) in the worst case.

- Create an empty data structure.
- Append an item to the end of the queue.
- Remove an item from the front of the queue.
- Return the i^{th} item in the queue.
- Remove the i^{th} item from the queue.

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Thank you for your response.

Hint: create a red–black BST where the keys are integers and the values are the items such that the i^{th} largest integer key in the red–black BST corresponds to the i^{th} item in the queue.