

Homework 3

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Written Assignments

1. Symbol Tables

- a) Give a trace of the process of inserting E A S Y Q U E S T I O N into an initially empty table using SequentialSearchST. How many compares are involved?

Solution:

- a.
- b.
- c.

- b) Give a trace of the process of inserting keys E A S Y Q U E S T I O N into an initially empty table using BinarySearchST. How many compares are involved?

Solution:

Solution?

2. Binary Search Tree

- a) Draw the *BST* that results when inserting M I D T E R M Q U E S T I O N into initially empty tree. How many compares are needed to build the tree?
- b) Draw the sequence of BSTs when deleting keys from the tree in question 2.a in the order they were inserted.
- c) Draw the sequence of BSTs when deleting keys from the tree in question 2.a in alphabetical order.
- d) Draw the sequence of BSTs when deleting keys from the tree in question 2.a by successively deleting the key at the root.
- e) Give the sequences of nodes examined when the methods in BST are used to compute each of the following quantities for the tree in question 2.a
- a. floor("P")
 - b. select(5)
 - c. ceiling("V")
 - d. rank("S")

Solution:

Solution?

3. 2-3 Trees

- 1) Draw the 2-3 tree that results when you insert E A S Y Q U E S T I O N in that order into an initially empty tree.
- 2) Draw the 2-3 tree that results when you insert Y L P M X H C R A E S T B C A in that order into an initially empty tree.

Solution:

P

P-R

4. Red-Black Trees Use LLRB trees for problem below:

- 1) Draw the red-black tree that results when you insert E A S Y Q U E S T I O N in that order into an initially empty tree.
- 2) Draw the red-black tree that results when you insert Y L P M X H C R A E S T B C A in that order into an initially empty tree.

Solution:

P

P-R

5. Hashing

- 1) Insert E X A M Q U E S T I O N into an initially empty table of $M = 5$ lists,
- 2) Draw the 2-3 tree that results when you insert Y L P M X H C R A E S T B C A in that order into an initially empty tree.

Solution:

P

P-R