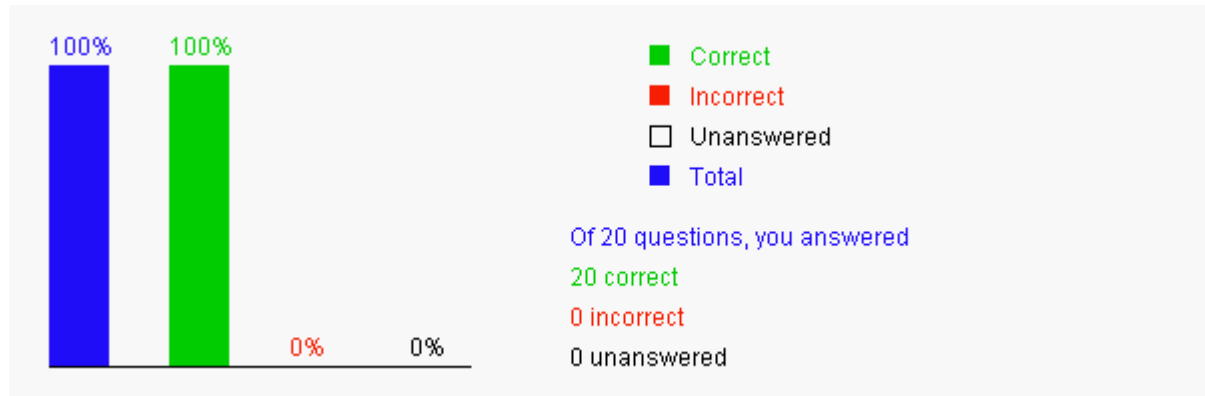


This quiz is for students to practice. A large number of additional quiz is available for instructors using Quiz Generator from the Instructor's Resource Website. Videos for Java, Python, and C++ can be found at <https://yongdanielliang.github.io/revelvideos.html>.

## Chapter 25 Binary Search Trees



Please send suggestions and errata to Dr. Liang at [y.daniel.liang@gmail.com](mailto:y.daniel.liang@gmail.com). Indicate which book and edition you are using. Thanks!

### Section 25.2 Binary Search Trees

**25.1** A \_\_\_\_\_ (with no duplicate elements) has the property that for every node in the tree the value of any node in its left subtree is less than the value of the node and the value of any node in its right subtree is greater than the value of the node.

- ☐ A. binary tree
- ☒ B. binary search tree
- ☐ C. list
- ☐ D. linked list

Your answer is correct



**25.2** The \_\_\_\_\_ of a path is the number of the edges in the path.

- ☒ A. length
- ☐ B. depth
- ☐ C. height
- ☐ D. degree

Your answer is correct



**25.3** The \_\_\_\_\_ of a node is the length of the path from the root to the node.

- ☐ A. length
- ☒ B. depth
- ☐ C. height
- ☐ D. degree

Your answer is correct



**25.4** The \_\_\_\_\_ of a nonempty tree is the length of the path from the root node to its furthest leaf + 1.

- ☐ A. length
- ☐ B. depth
- ☒ C. height
- ☐ D. degree

Your answer is correct



**25.5** The \_\_\_\_\_ is to visit the left subtree of the current node first, then the current node itself, and finally the right subtree of the current node.

- ☒ A. inorder traversal
- ☐ B. preorder traversal
- ☐ C. postorder traversal
- ☐ D. breadth-first traversal

Your answer is correct



**25.6** The \_\_\_\_\_ is to visit the left subtree of the current node first, then the right subtree of the current node, and finally the current node itself.

- ☐ A. inorder traversal

- ☐ B. preorder traversal
- ☒ C. postorder traversal
- ☐ D. breadth-first traversal

Your answer is correct



**25.7** The \_\_\_\_\_ is to visit the current node first, then the left subtree of the current node, and finally the right subtree of the current node.

- ☐ A. inorder traversal
- ☒ B. preorder traversal
- ☐ C. postorder traversal
- ☐ D. breadth-first traversal

Your answer is correct



**25.8** The \_\_\_\_\_ is to visit the nodes level by level. First visit the root, then all children of the root from left to right, then grandchildren of the root from left to right, and so on.

- ☐ A. inorder traversal
- ☐ B. preorder traversal
- ☐ C. postorder traversal
- ☒ D. breadth-first traversal

Your answer is correct



**25.9** In the implementation of BST, which of the following are true?

- ☒ A. Node is defined as an inner class inside BST.
- ☒ B. Node is defined as a static inner class inside BST because it does not reference any instance data fields in BST.
- ☒ C. Node has a property named left that links to the left subtree and a property named right that links to the right subtree and a property named right
- ☒ D. BST contains a property named root. If tree is empty, root is null.

Your answer is correct



**25.10** A new element is always inserted into a leaf node.

- ☒ A. True
- ☐ B. False

Your answer is correct



### Section 25.3 Deleting Elements from a BST

**25.11** The time complexity for searching an element in a binary search tree is \_\_\_\_\_.

- ☒ A.  $O(n)$
- ☐ B.  $O(\log n)$
- ☐ C.  $O(n \log n)$
- ☐ D.  $O(n^2)$

Your answer is correct



**25.12** The time complexity for inserting an element into a binary search tree is \_\_\_\_\_.

- ☒ A.  $O(n)$
- ☐ B.  $O(\log n)$
- ☐ C.  $O(n \log n)$
- ☐ D.  $O(n^2)$

Your answer is correct



**25.13** The time complexity for deleting an element into a binary search tree is \_\_\_\_\_.

- ☒ A.  $O(n)$
- ☐ B.  $O(\log n)$
- ☐ C.  $O(n \log n)$
- ☐ D.  $O(n^2)$

Your answer is correct



### Section 25.5 Iterators

**25.14** True or False? You can traverse the elements in a BST using a for-each loop.

- ☒ A. True  
☐ B. False

Your answer is correct 

**Section 25.6 Case Study: Data Compression**

**25.15** A Huffman tree is constructed using the \_\_\_\_\_ algorithm.

- ☐ A. dynamic programming  
☐ B. divide-and-conquer  
☒ C. greedy  
☐ D. back-tracking

Your answer is correct 

**25.16** Suppose the keys 3, 4, 45, 21, 92, 12 are inserted into a BST in this order. What is the inorder traversal of the elements?

- ☒ A. 3 4 12 21 45 92  
☐ B. 3 4 45 21 12 92  
☐ C. 12 21 92 45 4 3  
☐ D. 4 45 21 12 92 3  
☐ E. 4 21 12 92 45 3

Your answer is correct 

**25.17** Suppose the keys 3, 4, 45, 21, 92, 12 are inserted into a BST in this order. What is the preorder traversal of the elements?

- ☐ A. 3 4 12 21 45 92  
☒ B. 3 4 45 21 12 92  
☐ C. 12 21 92 45 4 3  
☐ D. 4 45 21 12 92 3  
☐ E. 4 21 12 92 45 3

Your answer is correct 

**25.18** Suppose the keys 3, 4, 45, 21, 92, 12 are inserted into a BST in this order. What is the postorder traversal of the elements?

- ☐ A. 3 4 12 21 45 92  
☐ B. 3 4 45 21 12 92  
☒ C. 12 21 92 45 4 3  
☐ D. 4 45 21 12 92 3  
☐ E. 4 21 12 92 45 3

Your answer is correct 

**25.19** Suppose the keys 3, 4, 45, 21, 92, 12 are inserted into a BST in this order. What is the preorder traversal of the elements after inserting 2 into the tree?

- ☐ A. 3 2 4 12 21 45 92  
☒ B. 3 2 4 45 21 12 92  
☐ C. 12 2 21 92 45 4 3  
☐ D. 4 2 45 21 12 92 3  
☐ E. 4 2 21 12 92 45 3

Your answer is correct 

**25.20** Suppose the keys 3, 4, 45, 21, 92, 12 are inserted into a BST in this order. What is the preorder traversal of the elements after deleting 45 from the tree?

- ☐ A. 3 4 12 21 92  
☒ B. 3 4 21 12 92  
☐ C. 12 21 92 45 4 3  
☐ D. 4 21 12 92 3

Your answer is correct 