

课程尚未开始 请大家耐心等待

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Binary Tree

九章算法IT求职面试培训课程 第3章

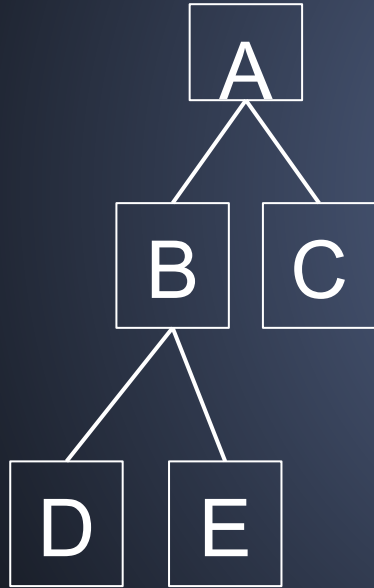
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Outline

1. Binary Tree DFS Traversal
 - preorder / inorder / postorder
 - Divide & Conquer
 - Introduce DFS Template
2. Binary Tree BFS Traversal
 - Introduce BFS template
3. Binary Search Tree

Binary Tree DFS Traversal

Binary Tree Traversal



Preorder: **A** BDE C

Postorder: DEB C **A**

inorder: DBE **A** C

Binary Tree Preorder Traversal

<http://lintcode.com/en/problem/binary-tree-preorder-traversal/>

<http://www.ninechapter.com/solutions/binary-tree-preorder-traversal/>

Divide & Conquer Algorithm

- Merge Sort
- Quick Sort
- Most of the Binary Tree Problems !

Maximum Depth of Binary Tree

<http://lintcode.com/en/problem/maximum-depth-of-binary-tree/>

<http://www.ninechapter.com/solutions/maximum-depth-of-binary-tree/>

Balanced Binary Tree

<http://lintcode.com/en/problem/balanced-binary-tree/>

<http://www.ninechapter.com/solutions/balanced-binary-tree/>

Binary Tree Maximum Path Sum

<http://lintcode.com/en/problem/binary-tree-maximum-path-sum/>

<http://www.ninechapter.com/solutions/binary-tree-maximum-path-sum/>

Lowest Common Ancestor

<http://lintcode.com/en/problem/lowest-common-ancestor/>

<http://www.ninechapter.com/solutions/lowest-common-ancestor/>

Binary Tree DFS Template

<http://www.ninechapter.com/solutions/dfs-template/>

5 minutes break

Binary Tree BFS Traversal

Binary Tree Level Order Traversal

<http://lintcode.com/en/problem/binary-tree-level-order-traversal/>

<http://www.ninechapter.com/solutions/binary-tree-level-order-traversal/>

Binary Tree Level Order Traversal

- 2 Queues
- 1 Queue + Dummy Node
- 1 Queue (best)

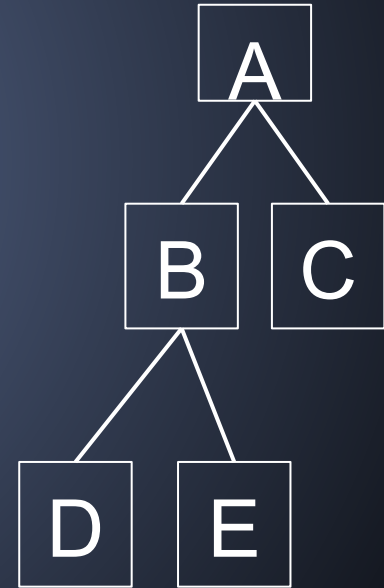
Binary Tree Level Order Traversal

- 2 Queues
- 1 Queue + Dummy Node
- 1 Queue (best)

A #

A # B C

A # B C # D E



Binary Tree Level Order Traversal II

<http://lintcode.com/en/problem/binary-tree-level-order-traversal-ii/>

<http://www.ninechapter.com/solutions/binary-tree-level-order-traversal-ii/>

Binary Tree Zigzag Level Order Traversal

<http://lintcode.com/en/problem/binary-tree-zigzag-level-order-traversal/>

<http://www.ninechapter.com/solutions/binary-tree-zigzag-level-order-traversal/>

Binary Tree BFS Template

<http://www.ninechapter.com/solutions/bfs-template/>

Binary Search Tree

Validate Binary Search Tree

<http://lintcode.com/en/problem/validate-binary-search-tree/>

<http://www.ninechapter.com/solutions/validate-binary-search-tree/>

Insert a Node in Binary Search Tree

<http://lintcode.com/zh-cn/problem/insert-node-in-a-binary-search-tree/>

<http://www.ninechapter.com/solutions/insert-node-in-binary-search-tree/>

Search Range in a Binary Search Tree

<http://lintcode.com/en/problem/search-range-in-binary-search-tree/>

<http://www.ninechapter.com/solutions/search-range-in-binary-search-tree/>

Implement iterator of Binary Search Tree

<http://lintcode.com/en/problem/implement-iterator-of-binary-search-tree/>

<http://www.ninechapter.com/solutions/implement-iterator-of-binary-search-tree/>

Remove Node in Binary Search Tree

<http://lintcode.com/en/problem/remove-node-in-binary-search-tree/>

<http://www.ninechapter.com/solutions/remove-node-in-binary-search-tree/>

<http://www.mathcs.emory.edu/~cheung/Courses/171/Syllabus/9-BinTree/BST->

Remove Node in Binary Search Tree

Steps:

1. Find the node
2. Find the maximum node in the left subtree
3. Replace the node with the maximum node in the left subtree.

Remove Node in Binary Search Tree

Special Cases:

1. The node does not have a left child.
2. The maximum node in the left subtree has a left child.
3. The node is the root of the tree.