Binary Tree & Divide Conquer

主讲: 令狐冲

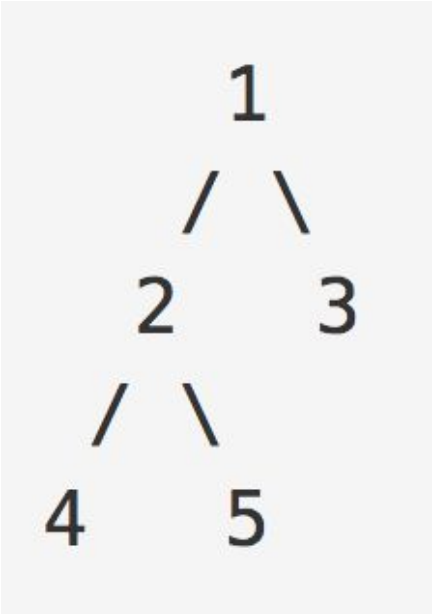
扫描二维码关注微信/微博
获取最新面试题及权威解答

微信: ninechapter
微博: http://www.weibo.com/ninechapter
官网: www.jiuzhang.com

Outline

- DFS in Binary Tree
  - Preorder / Inorder / Postorder
  - Introduce Divide Conquer Algorithm
  - Non-recursion vs Traverse vs Divide Conquer
- BFS in Binary Tree
- Binary Searh Tree
  - Insert / Remove / Find / Validate

Preorder Postorder Inorder



- Preorder 前序遍历
  - **1** 245 3 根左右
- Inorder 中序遍历
  - 425 **1** 3 左根右
- Postorder 后序遍历
  - 452 3 **1** 左右根

DFS in Binary Tree

九章算法

- Preorder:
  - http://www.lintcode.com/problem/binary-tree-preorder-traversal/
  - http://www.jiuzhang.com/solutions/binary-tree-preorder-traversal/
- Inorder
  - http://www.lintcode.com/en/problem/binary-tree-inorder-traversal/
  - http://www.jiuzhang.com/solutions/binary-tree-inorder-traversal/
- Postorder:
  - http://www.lintcode.com/en/problem/binary-tree-postorder-traversal/
  - http://www.jiuzhang.com/solutions/binary-tree-postorder-traversal/

Divide Conquer Algorithm

九章算法

- Traverse vs Divide Conquer
  - They are both Recursion Algorithm
  - Result in parameter vs Result in return value
  - Top down vs Bottom up

- Merge Sort / Quick Sort
- 90% Binary Tree Problems!

独孤九剑 之 破枪式

碰到二叉树的问题，就想想整棵树在该问题上的结果

和左右儿子在该问题上的结果之间的联系是什么

Max Depth of Binary Tree

http://www.lintcode.com/problem/maximum-depth-of-binary-tree/

http://www.jiuzhang.com/solutions/maximum-depth-of-binary-tree/

Related Question: Minimum Depth of Binary Tree

Balanced Binary Tree

http://www.lintcode.com/problem/balanced-binary-tree/

http://www.jiuzhang.com/solutions/balanced-binary-tree/

When we need ResultType?

Lowest Common Ancesstor

http://www.lintcode.com/problem/lowest-common-ancestor/

http://www.jiuzhang.com/solutions/lowest-common-ancestor/

with parent pointer vs no parent pointer

Binary Tree Maximum Path Sum

http://www.lintcode.com/problem/binary-tree-maximum-path-sum/

http://www.jiuzhang.com/solutions/binary-tree-maximum-path-sum/

any to any vs root to any

5 Minutes Break

BFS in Binary Tree

Binary Tree Level Order Traversal

http://www.lintcode.com/problem/binary-tree-level-order-traversal/

http://www.jiuzhang.com/solutions/binary-tree-level-order-traversal/

- 2 Queues
- 1 Queue + Dummy Node
- **1 Queue (Best)**

Follow Up

Can you do it in DFS?

Related Questions

Binary Tree Level Order Traversal II

- http://www.lintcode.com/problem/binary-tree-level-order-traversal-ii/
- http://www.jiuzhang.com/solutions/binary-tree-level-order-traversal-ii/

Binary Tree Zigzag Level Order Traversal

- http://www.lintcode.com/problem/binary-tree-zigzag-level-order-traversal/
- http://www.jiuzhang.com/solutions/binary-tree-zigzag-level-order-traversal/

Validate Binary Search Tree

http://www.lintcode.com/problem/validate-binary-search-tree/

http://www.jiuzhang.com/solutions/validate-binary-search-tree/

traverse vs divide conquer

Inorder Successor in Binary Search Tree

http://www.lintcode.com/problem/inorder-successor-in-binary-search-tree/

http://www.jiuzhang.com/solutions/inorder-successor-in-binary-search-tree/

Binary Search Tree Iterator

http://www.lintcode.com/en/problem/binary-search-tree-iterator/

http://www.jiuzhang.com/solutions/binary-search-tree-iterator/

Iterator vs Inorder with non-recursion

Related Questions

Search Range in Binary Search Tree

http://www.lintcode.com/problem/search-range-in-binary-search-tree/

Insert Node in a Binary Search Tree

http://www.lintcode.com/problem/insert-node-in-a-binary-search-tree/

Remove Node in a Binary Search Tree

http://www.lintcode.com/problem/remove-node-in-binary-search-tree/

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

Conclusion

- DFS in Binary Tree
  - Traverse vs Divide Conquer
  - Non Recursion for Preorder + Inorder
- BFS in Binary Tree
  - 1 Queue
- Binary Search Tree
  - Inorder vs BST