链表与数组
Linked List & Array

课程版本 v4.2　　主讲 令狐冲

扫描二维码关注微信/微博
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大纲 Outline

- Linked List
  - Dummy Node
  - High Frequency
- Array
  - Subarray
  - Sorted Array

Basic Knowledge Test

九章算法

- What's the output of the following code?

```
1  void print(ListNode node) {
2      while (node != null) {
3          System.out.print(node.val);
4          System.out.print("->");
5          node = node.next;
6      }
7      System.out.println("null");
8  }
9
10 void main() {
11     // connect nodes and connect them to a linked list
12     ListNode node1 = new ListNode(1);
13     ListNode node2 = new ListNode(2);
14     ListNode node3 = new ListNode(3);
15
16     node1.next = node2;
17     node2.next = node3;
18
19     // print head
20     ListNode head = node1;
21     print(head);
22
23     // print head again
24     node1 = node2;
25     print(head);
26 }
```

Reverse Nodes in k-Groups

http://www.lintcode.com/en/problem/reverse-nodes-in-k-group/

http://www.jiuzhang.com/solutions/reverse-nodes-in-k-group/

独孤九剑 —— 破索式

链表结构发生变化时

就需要 Dummy Node

Dummy Node 哨兵节点八问八答

如何使用 Dummy Node

head = dummy 这句话总是需要么？

什么时候使用 Dummy Node?

Dummy Node 是否需要删除？

使用 Dummy Node 算面试官会说我耗费了额外空间么？

Dummy Node 非用不可么？

Dummy Node 初始化的值重要么？

链表的问题都需要用到 Dummy Node 么？

用到了 Dummy Node 的值得一做的题目

http://www.lintcode.com/en/problem/partition-list/

http://www.lintcode.com/en/problem/merge-two-sorted-lists/

http://www.lintcode.com/en/problem/reverse-linked-list-ii/

http://www.lintcode.com/en/problem/swap-two-nodes-in-linked-list/

http://www.lintcode.com/en/problem/reorder-list/

http://www.lintcode.com/en/problem/rotate-list/

Copy List with Random Pointer

http://www.lintcode.com/problem/copy-list-with-random-pointer/

http://www.jiuzhang.com/solutions/copy-list-with-random-pointer/

Linked List Cycle

http://www.lintcode.com/en/problem/linked-list-cycle/

http://www.jiuzhang.com/solutions/linked-list-cycle/

follow up:

http://www.lintcode.com/en/problem/linked-list-cycle-ii/

http://www.jiuzhang.com/solutions/intersection-of-two-linked-lists/

Sort List

http://www.lintcode.com/en/problem/sort-list/

http://www.jiuzhang.com/solutions/sort-list/

问：哪些排序算法时间复杂度是 O(nlogn) 的？

问：哪些排序算法空间复杂度是 O(1) 的？

Related Questions

- http://www.lintcode.com/problem/convert-sorted-list-to-balanced-bst/
- http://www.lintcode.com/problem/delete-node-in-the-middle-of-singly-linked-list/
- http://www.lintcode.com/problem/convert-binary-search-tree-to-doubly-linked-list/

休息5分钟

Take a break

Sorted Array

排序数组

Merge Two Sorted Arrays

http://www.lintcode.com/problem/merge-two-sorted-arrays

http://www.jiuzhang.com/solutions/merge-two-sorted-arrays/

Related Questions

- 将小数组归并到大数组里
  - http://www.lintcode.com/problem/merge-sorted-array/
  - http://www.jiuzhang.com/solutions/merge-sorted-array/

- 两个数组的交
  - http://www.lintcode.com/problem/intersection-of-two-arrays/

- 数组内积（点乘）
  - Example [1,3] · [2,4] = 1*2 + 3*4 = 14
  - Follow up: 两个数组都非常大，但是其中都包含很多0
  - Example [1,0,0,0,0 …, 0, 2, 0,…, 0, 3] · [0,…, 0, 4, 0,…, 0, 5]

Median of Two Sorted Arrays

http://www.lintcode.com/problem/median-of-two-sorted-arrays/

http://www.jiuzhang.com/solutions/median-of-two-sorted-arrays/

子数组 Subarray

令 PrefixSum[i] = A[0] + A[1] + … A[i - 1], PrefixSum[0] = 0

易知构造 PrefixSum 耗费 O(n) 时间和 O(n) 空间

如需计算子数组从下标i到下标j之间的所有数之和

则有 **Sum(i~j) = PrefixSum[j + 1] - PrefixSum[i]**

Maximum Subarray

http://www.lintcode.com/en/problem/maximum-subarray/

http://www.jiuzhang.com/solutions/maximum-subarray/

Subarray Sum

http://www.lintcode.com/en/problem/subarray-sum/

http://www.jiuzhang.com/solutions/subarray-sum/

Subarray Sum Closest

http://www.lintcode.com/en/problem/subarray-sum-closest/

http://www.jiuzhang.com/solutions/subarray-sum-closest/