# Hey, CoderGirl

Thursday, January 21, 2016

# LeetCode总结-substring, subarray, subsequence

## DP动态规划

## 53 Maximum Subarray

[题目] 在数组中找到和最大的subarray, 要求是连续的。

[思路]一维DP。维护两个变量,一个是全局的最大值,一个是local的最大值,因为sublist有多个,比较哪个大。

#### 152 Maximum Product Subarray

[题目] 求subarray最大的乘积,要求连续。

[思路] 一维dp。乘法要考虑符号,所以同时维持localmax 和localmin两个变量。类似上面求sum的题。

#### 5 Longest Palindromic Substring

[题目] 给定字符串s, 返回最长的回文子串

[方法一] 二维dp

[方法二] Manacher's Algorithm, 时间复杂度为o(n)

### 300 Longest Increasing Subsequence

[题目] 求最长递增子序列。可以不连续

[方法一]一维dp。Dp[i]表示,以i结尾的的递增子序列的最大长度。.时间复杂度O(n^2)

[方法二]利用stack+binary search。O(nlogn)的解法。这个解法只能确定长度,但是并不能找到一个正确的上升子序列。

# Slide Window滑动窗口 + hash

## 209 Minimum Size Subarray Sum

[题目] 给定一个数组,求最短的subarray,使得其sum大于等于给定的target

[方法一] brute force。时间复杂度为O(n^2)。

[方法二] 遍历+binary search。时间复杂度为O(nlogn)

维护一个数组sum, sum[i]表示0到i的sum值。

外层循环遍历i,内层循环binary search j,使得sum[i]-sum[j] > s

[方法三] slide window。时间复杂度为O(n)

当窗口内的sum小于s时,窗口right增加

当窗口内的sum小于等于sum时,记录最小值,并且左侧窗口缩减

[注意] 最外层循环终止的条件时right<数组长度,而不是left<=right

## 3 Longest Substring Without Repeating Characters

[题目] 找最长的没有重复的substring

[思路] slide window + hash

#### 30 Substring with Concatenation of All Words

[题目] You are given a string, s, and a list of words, words, that are all of the same length. Find all starting indices of substring(s) in s that is a concatenation of each word in words exactly once and without any intervening characters.

For example, given:

s: "barfoothefoobarman"

words: ["foo", "bar"]

You should return the indices: [0,9].

[思路] slide window + hash

#### Labels

- Backtracking
- BFS
- Binary search
- Binary Search Tree
- · Bit manipulation
- Bucket sort
- · Complete Binary Tree
- Design
- DFS
- · Doubly Linked List
- Dynamic Programming
- Greedy
- Hash
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- Math
- Matrix
- Queue
- Recursion
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- Sort
- Stack
- String
- Topological Sort
- Tree
- Trie
- Two pointers
- 进度

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#### 76 Minimum Window Substring

[题目] Given a string S and a string T, find the minimum window in S which will contain <u>all the characters</u> in T in complexity O(n)。

For example,

S = "ADOBECODEBANC"

T = "ABC"

Minimum window is "BANC".

[思路] slide window + hash

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## hash

## 128 Longest Consecutive Sequence

[题目] 求一个未排序数组的最长的连续子序列。要求o(n)。

For example,

Given [100, 4, 200, 1, 3, 2],

The longest consecutive elements sequence is [1, 2, 3, 4]. Return its length: 4. [思路] 因为要求O(n)。则考虑用hash表。把每个数字存在hash表中。遍历,如果num [i] -1不在hash中则说明是个起始点。然后判断num[i]+1在不在hash中。

#### 159 Longest Substring with At Most Two Distinct Characters (lock)

#### 325 Maximum Size Subarray Sum Equals k

[题目] 给定有正有负的数组,然后求最长的subarray使得结果等于k

[思路]209 Minimum Size Subarray Sum是求窗口最小,全部非负数,找大于等于target的subarray,所以用two pointers。

这道题可正可负,并且是找确切的值。所以预处理一下,利用一个hash表,key存array [0...i] 的sum, value存index。然后再遍历一遍,找对应的值存在不存在,并且要求比当前的index小。

## follow up:

- 类似的可以找一个subarray有没有等于0的。
  http://www.geeksforgeeks.org/find-if-there-is-a-subarray-with-0-sum/
- 找subarray有没有等于k的
- 找submatrix有没有等于k的(变成2D)

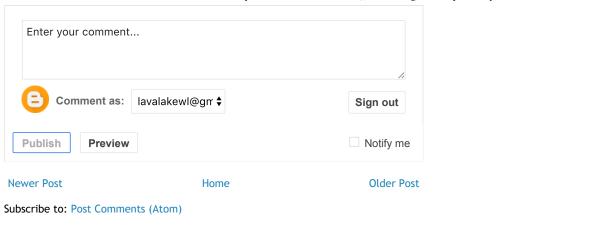
Posted by CoderGirl at 1:51 PM

G+

Labels: Dynamic Programming, Hash, leetcode总结, Slide Window

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