12/11/20

12/29/20

Leetcode:

1. Array-based
2. Link-list

Review + new problem

**Need\_to\_review:**

* for i,n in enumerate(**itertools.accumulate**(nums)

**1054: Distant Barcode**

**Input:** barcodes = [1,1,1,1,2,2,3,3]

**Output:** [1,3,1,3,1,2,1,2]

Rearrange the barcodes so that no two adjacent barcodes are equal.

1. Use heapq as **priority Q**.
2. 229. Bulls and Cows

**Input:** secret = "1807", guess = "7810"

**Output:** "1A3B"

Use collections.Counter()

Two Linear Scans

1. **Increasing Subsequences**
2. **300. Longest Increasing Subsequence**

Simply dp.

**dp = [1] \* n**

**max\_len = 1**

# Recursive back-track

**for i in range(n):**

**for j in range(i):**

**if nums[i] > nums[j]:**

len\_new = dp[j]+1

dp[i] = len\_new if len\_new > dp[i] else dp[i]

**max\_len** = max(max\_len, dp[i])

**return max\_len**

1. **673. Number of Longest Increasing Subsequence**

def findNumberOfLIS(self, nums: List[int]) -> int:

# 10:43 --> 11:00 --> 11;16 9/1/20 Num of longest increasing subsequence

dp = [[1, 1] for i in range(len(nums))]

max\_len = 0

max\_cnt = 0

**for i, num in enumerate(nums):**

**for j in range(i):**

**if num > nums[j]:**

len\_new = dp[j][0] + 1

if len\_new > dp[i][0]:

dp[i][0], dp[i][1] = len\_new, dp[j][1]

elif len\_new == dp[i][0]:

dp[i][1] += dp[j][1]

**if max\_len == dp[i][0]:**

max\_cnt += dp[i][1]

**if max\_len < dp[i][0]:**

max\_len = dp[i][0]

max\_cnt = dp[i][1]

return **max\_cnt**

1. **1546. Maximum Number of Non-Overlapping Subarrays With Sum Equals Target**

* Use cumulative sum as an array, find diff between elements

**DP solution**

def maxNonOverlapping(self, nums: List[int], target: int) -> int:

n = len(nums)

sums = [0]\*n

**res = [0] \* n**

max\_len = 0

**dic = {}**

**# cumulative SUM**

**for i in range(n):**

**sums[i] = sums[i-1] + nums[i] if i > 0 else nums[i]**

**for i, v in enumerate(sums):**

**val = v - target**

if val in dic:

res[i] = res[dic[val]] + 1

elif val == 0:

res[i] = 1

**dic[v] = i**

if i > 0:

res[i] = max(res[i], res[i-1])

return res[n-1]

* **Greedy, best soln**

**dic = {0:1}**

**cnt = 0**

**cur\_sum = 0**

**for num in nums**:

cur\_sum += num

prev\_sum = cur\_sum - target

if prev\_sum in dic:

**cnt += 1**

**dic = {0:1}**

**cur\_sum = 0**

else:

dic[cur\_sum] = 1

return cnt

* **Greedy using set**

**pre\_sum = set([0])**

**cnt = 0**

**cur\_sum = 0**

**for num in nums**:

cur\_sum += num

if cur\_sum - target in pre\_sum:

**cnt += 1**

**cur\_sum = 0**

**pre\_sum.clear()**

**pre\_sum.add(0)**

else:

pre\_sum.add(cur\_sum)

return cnt

1. **Continuous SUM**
2. **523. Continuous Subarray Sum**

* Brute Force

def checkSubarraySum(self, nums: List[int], k: int) -> bool:

# // 6/11/20

n = len(nums)

**for i, v in enumerate(nums):**

total = v

**for j in range(i+1,n):**

total += nums[j]

if k != 0 and total % k == 0:

return True

if k == total == 0:

return True

return False

* Using Dict

 if sum(nums[i:j]) % k == 0 for some i < j, then sum(nums[:j]) % k == sum(nums[:i]) % k.

 So we just need to use a dictionary to keep track of sum(nums[:i]) % k and the corresponding index i. Once some later **sum(nums[:i']) % k** == **sum(nums[:i]) % k**and i' - i > 1, we return True.

[0,0]

**def checkSubarraySum(self, nums: List[int], k: int) -> bool:**

# // 6/11/20

**dic = {0:-1}**

**sum\_cur = 0**

for i, v in enumerate(nums):

sum\_cur += v

if k == 0:

if i > 0 and v == nums[i-1]==0:

return True

else:

**tmp** = sum\_cur % k

if tmp in dic:

if i - dic[tmp] > 1:

return True

else:

dic[tmp] = i

return False

-----------------------------------------------------------------------------------

**def checkSubarraySum(self, nums: List[int], k: int) -> bool:**

# // 6/11/20

dic = {0:-1}

sum\_cur = 0

for i, v in enumerate(nums):

sum\_cur += v

if k == 0:

if i > 0 and v == nums[i-1]==0:

return True

else:

sum\_cur = sum\_cur % k

if sum\_cur in dic:

if i - dic[sum\_cur] > 1:

return True

else:

dic[sum\_cur] = i

return False

def checkSubarraySum(self, nums: List[int], k: int) -> bool:

# // 6/11/20

dic = {0:-1}

summ = 0

for i, n in enumerate(nums):

if k != 0:

summ = (summ + n) % k

else:

summ += n

if summ not in dic:

dic[summ] = i

else:

if i - dic[summ] >= 2:

return True

return False

1. **Bucket Sort**
2. **220 Contains Duplicate III**

* def containsNearbyAlmostDuplicate(self, nums: List[int], k: int, t: int) -> bool:

# nums[i] - nums[j] <= t

# i - j <= k

if t<0 or k<0:

return False

**allBuckets = {}**

**bucketSize = t+1 #**

**#Two benefits for using t+1 as bucket size:**

**# 1. avoid case t = 0**

**# 2.To fit number of t in each bucket**

**for i in range(len(nums)):**

# m is bucket Index for nums[i]

**m = nums[i]//bucketSize**

#if there is a bucket already present corresponding to current number

if m in allBuckets:

return True

#checking two adjacent buckets m, m-1

if (m-1) in allBuckets and abs(nums[i]-allBuckets[m-1])<bucketSize:

return True

#checking two adjacent buckets m, m+1

if (m+1) in allBuckets and abs(nums[i]-allBuckets[m+1])<bucketSize:

return True

**allBuckets[m]= nums[i]**

#removing the bucket corresponding to number out of our k sized window

**if i>=k:**

**allBuckets.pop( nums[i-k]//bucketSize)**

return False

* **Sorting**

def containsNearbyAlmostDuplicate(self, nums: List[int], k: int, t: int) -> bool:

# nums[i] - nums[j] <= t

# i - j <= k

n = len(nums)

**A = list(zip(nums, range(n)))**

**A.sort()**

for i in range(n):

j = i + 1

while j < n and **A[j][0] - A[i][0]** <= t:

if abs(**A[j][1] - A[i][1]**) <= k:

return True

else:

j += 1

return False

* **DefaultDict**

def containsNearbyAlmostDuplicate(self, nums: List[int], k: int, t: int) -> bool:

# 9:59 --> 10:12 7/24/20

# t -> nums[i] - nums[j]

# k => i - j

if k < 1 or t < 0:

return False

dic = **collections.OrderedDict()**

for num in nums:

key = num if t == 0 else num // t

for m in [dic.get(key-1), dic.get(key), dic.get(key+1)]:

if m is not None and abs(num-m) <= t:

return True

if len(dic) == k:

dic.popitem(last=False)

dic[key] = num

return False