

Assignment #8: 田忌赛马来了

Updated 1021 GMT+8 Nov 12, 2024

2024 fall, Compiled by 徐嘉期、地空

说明:

- 1) 请把每个题目解题思路 (可选), 源码Python, 或者C++ (已经在Codeforces/Openjudge上AC), 截图 (包含Accepted), 填写到下面作业模版中 (推荐使用 typora <https://typoraio.cn>, 或者用word)。AC 或者没有AC, 都请标上每个题目大致花费时间。
- 2) 提交时候先提交pdf文件, 再把md或者doc文件上传到右侧“作业评论”。Canvas需要有同学清晰头像、提交文件有pdf、"作业评论"区有上传的md或者doc附件。
- 3) 如果不能在截止前提交作业, 请写明原因。

1. 题目

12558: 岛屿周长

matrices, <http://cs101.openjudge.cn/practice/12558/>

思路:

每次从stack里pop出一个坐标, 周长加4, 然后减去2*相邻的1数目, 状态标记为false, 然后将四周状态为True的1的坐标append到stack中

代码:

```
n,m = map(int,input().split())
check = [[True]*(m+2) for _ in range(n+2)]
matrix = [[0]*(m+2) for _ in range(n+2)]

for _ in range(1,n+1):
    matrix[_][1:-2] = list(map(int,input().split()))
direct = [(-1,0),(1,0),(0,-1),(0,1)]
stat = False
for i in range(1,n+1):
    if stat:
        break
    for j in range(1,m+1):
        if matrix[i][j] == 1 and check[i][j]:
            stack = {(i,j)}
            stat = True
            break
    else:
        print("0")
        exit()
count = 0
while stack:
    count += 4
```

```

x,y = stack.pop()
check[x][y]= False
for dx,dy in dirct:
    if matrix[x+dx][y+dy]:
        if not check[x+dx][y+dy]:
            count -= 2
        else:
            stack.add((x+dx,y+dy))
print(count)

```

代码运行截图 (至少包含有"Accepted")

[题目](#)
[排名](#)
[状态](#)
[提问](#)

#47175532提交状态

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状态: **Accepted**

源代码

```

n,m = map(int,input().split())
check = [[True]*(m+2) for _ in range(n+2)]
matrix = [[0]*(m+2) for _ in range(n+2)]

for i in range(1,n+1):
    matrix[i][1:-2] = list(map(int,input().split()))
dirct = [(1,0),(1,0),(0,-1),(0,1)]
stat = False
for i in range(1,n+1):
    if stat:
        break
    for j in range(1,m+1):
        if matrix[i][j] == 1 and check[i][j]:
            stack = [(i,j)]
            stat = True
            break
    else:
        print("0")
        exit()
count = 0
while stack:
    count += 4
    x,y = stack.pop()
    check[x][y]= False
    for dx,dy in dirct:
        if matrix[x+dx][y+dy]:
            if not check[x+dx][y+dy]:
                count -= 2
            else:
                stack.add((x+dx,y+dy))
print(count)

```

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基本信息

#: 47175532

题目: 12558

提交人: 24n2400012440徐嘉期

内存: 3872kB

时间: 28ms

语言: Python3

提交时间: 2024-11-15 14:44:32

LeetCode54.螺旋矩阵

matrice, <https://leetcode.cn/problems/spiral-matrix/>

与OJ这个题目一样的 18106: 螺旋矩阵, <http://cs101.openjudge.cn/practice/18106>

思路:

代码:

```

n = int(input())
matrix = [[] for _ in range(n)]
ans = []
direction = [(0,1),(1,0),(0,-1),(-1,0)]
check = [[True] * n for _ in range(n)]
for i in range(n):
    matrix[i] = list(map(int,input().split()))
stack = [(0,0)]
dirc = 0
count = 1
while stack and count <= 4:
    x,y = stack.pop()

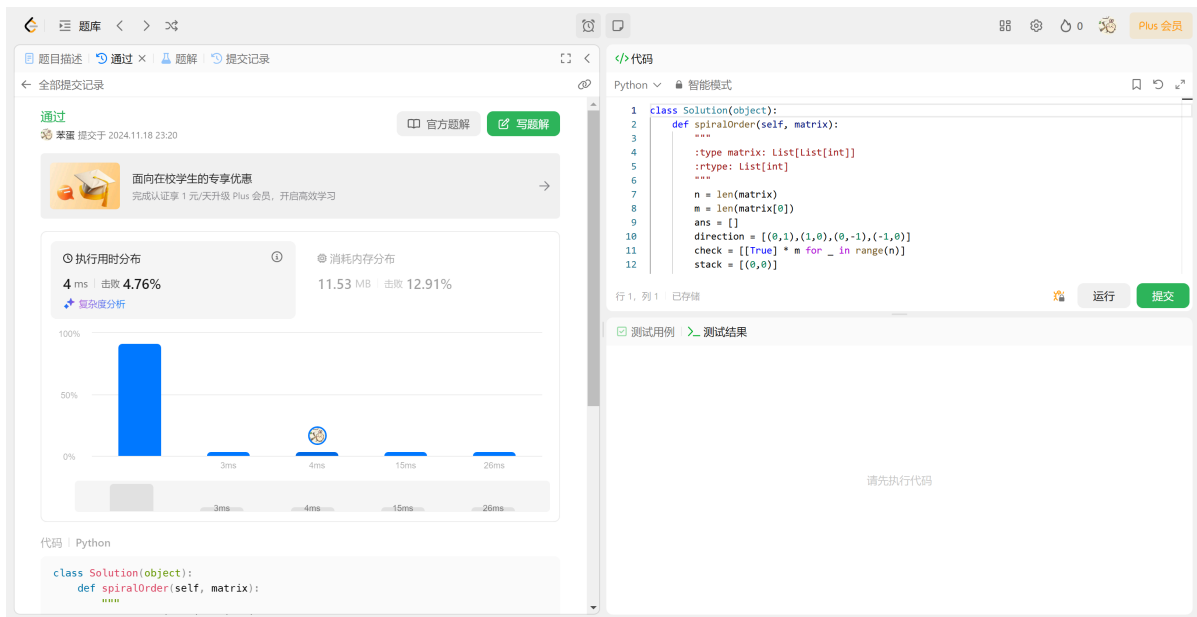
```

```

ans.append(matrix[x][y])
check[x][y] = False
dx,dy = direction[dirc]
if x+dx in range(n) and y+dy in range(n) and check[x+dx][y+dy]:
    stack.append((x+dx,y+dy))
    count = 1
else:
    count += 1
    ans.pop()
    stack.append((x,y))
    dirc = (dirc+1)%4
ans.append(matrix[x][y])
print(ans)

```

代码运行截图 (至少包含有"Accepted")



04133:垃圾炸弹

matrices, <http://cs101.openjudge.cn/practice/04133/>

思路:

代码:

```

d = int(input())
n = int(input())
map1 = []
max1 = 0
l1 = [0]*(1025)
for _ in range(1025):
    map1.append(l1.copy())
for _ in range(n):
    x, y, z = map(int, input().split())
    for i in range(max(x-d,0),min(x+d+1,1025)):

```

```

for j in range(max(y-d,0),min(y+d+1,1025)):
    map1[i][j] += z
    if map1[i][j] > max1:
        max1 = map1[i][j]
print(sum([map1[i].count(max1) for i in range(1025)]), max1)

```

代码运行截图 (至少包含有"Accepted")

OpenJudge
题目ID, 标题, 描述
24n2400012440徐嘉期 信箱 账号

CS101 / 题库 (包括计概、数算题目)
题目 排名 状态 提问

#47176051提交状态
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状态: Accepted

源代码

```

d = int(input())
n = int(input())
map1 = []
max1 = 0
l1 = [0] * (1025)
for _ in range(1025):
    map1.append(l1.copy())
for i in range(n):
    x, y, z = map(int, input().split())
    for i in range(max(x-d,0),min(x+d+1,1025)):
        for j in range(max(y-d,0),min(y+d+1,1025)):
            map1[i][j] += z
            if map1[i][j] > max1:
                max1 = map1[i][j]
print(sum([map1[i].count(max1) for i in range(1025)]), max1)

```

基本信息

```

#: 47176051
题目: 04133
提交人: 24n2400012440徐嘉期
内存: 11928kB
时间: 59ms
语言: Python3
提交时间: 2024-11-15 15:06:45

```

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English 帮助 关于

LeetCode376.摆动序列

greedy, dp, <https://leetcode.cn/problems/wiggle-subsequence/>

与OJ这个题目一样的, 26976:摆动序列, <http://cs101.openjudge.cn/routine/26976/>

思路:

代码:

```

class Solution(object):
    def wiggleMaxLength(self, nums):
        """
        :type nums: List[int]
        :rtype: int
        """
        len1 = len(nums)
        dp1 = [1] * len1
        dp2 = [1] * len1
        max1 = 1
        for i in range(1, len1):
            for j in range(i):
                if nums[j] < nums[i]:
                    dp1[i] = max(dp2[j]+1, dp1[i])
                if nums[j] > nums[i]:

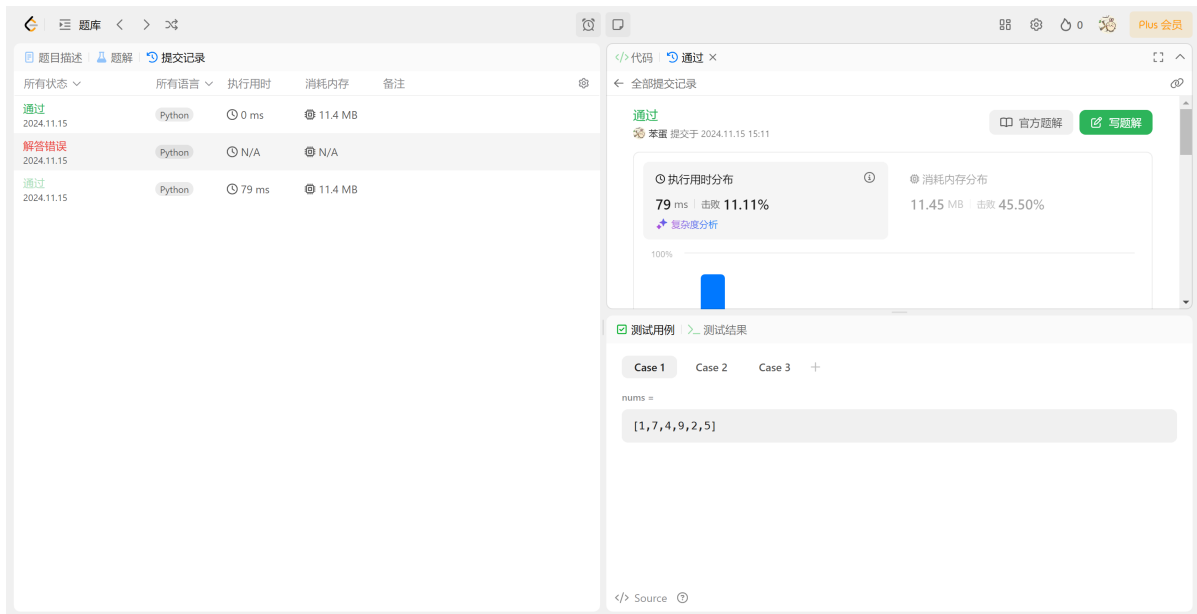
```

```

        dp2[i] = max(dp2[i], dp1[j]+1)
    max1 = max(max1, dp1[i], dp2[i])
return max1

```

代码运行截图 (至少包含有"Accepted")



CF455A: Boredom

dp, 1500, <https://codeforces.com/contest/455/problem/A>

思路:

代码:

```

n = int(input())
l1 = list(map(int, input().split()))
dict1 = {}
l2=[]
for i in l1 :
    if i in dict1:
        dict1[i] += i
    else:
        dict1[i] = i
        l2.append(i)
l2.sort()
len1 = len(dict1)
dp1 = [0] * len1
dp2 = [0] * len1
dp1[0] = dict1[l2[0]]
max1 = dp1[0]
for i in range(1, len1):
    dp2[i] = max(dp1[i-1], dp2[i-1])
    if l2[i]-1 == l2[i-1]:
        if i>1:

```

```

        dp1[i] = max(dp1[i-2], dp2[i-1]) + dict1[l2[i]]
    if i == 1:
        dp1[i] = dict1[l2[i]]
    else:
        dp1[i] = max(dp2[i-1], dp1[i-1]) + dict1[l2[i]]
    max1 = max(max1, dp1[i], dp2[i])
print(max1)

```

代码运行截图 (至少包含有"Accepted")

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PROBLEMS SUBMIT CODE MY SUBMISSIONS **STATUS** HACKS ROOM STANDINGS CUSTOM INVOCATION

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
291082292	Practice: xjq123123	455A - 35	Python 3	Accepted	234 ms	13064 KB	2024-11-11 18:26:20	2024-11-11 18:26:20	★	Compare

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```

n = int(input())
l1 = list(map(int, input().split()))
dict1 = {}
l2 = []
for i in l1:
    if i in dict1:
        dict1[i] += 1
    else:
        dict1[i] = 1
l2.append(i)
l2.sort()
len1 = len(dict1)
dp1 = [0] * len1
dp2 = [0] * len1
dp1[0] = dict1[l2[0]]
max1 = dp1[0]
for i in range(1, len1):
    dp2[i] = max(dp1[i-1], dp2[i-1])
    if l2[i-1] == l2[i-1]:
        if i > 1:
            dp1[i] = max(dp1[i-2], dp2[i-1]) + dict1[l2[i]]
            if i == 1:
                dp1[i] = dict1[l2[i]]
        else:
            dp1[i] = max(dp2[i-1], dp1[i-1]) + dict1[l2[i]]
    max1 = max(max1, dp1[i], dp2[i])
print(max1)

```

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02287: Tian Ji -- The Horse Racing

greedy, dfs <http://cs101.openjudge.cn/practice/02287>

思路:

greedy又没想到, 只想到了 $O(n^2)$ 的暴力算法

代码:

```

n = int(input())
from bisect import bisect_left
from bisect import bisect_right
while n:

    l2 = sorted(list(map(int, input().split())))
    l1 = sorted(list(map(int, input().split())))
    max1 = -float("inf")
    for k in range(n):
        curr = 0
        for i in range(n):
            id1 = (i+k) % n
            if l2[id1] > l1[i]:

```

```
curr += 200
if l2[id1] < l1[i]:
    curr -= 200
max1 = max(curr, max1)
print(max1)
n = int(input())
```

代码运行截图 (至少包含有"Accepted")

OpenJudge

题目ID, 标题, 描述

24n2400012440徐嘉期 信箱 账号

CS101 / 题库 (包括计概、数算题目)

题目 排名 状态 提问

#47190464提交状态

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状态: Accepted

源代码

```
n = int(input())
from bisect import bisect_left
from bisect import bisect_right
while n:
    l2 = sorted(list(map(int, input().split())))
    l1 = sorted(list(map(int, input().split())))
    max1 = -float("inf")
    for k in range(n):
        curr = 0
        for i in range(n):
            id1 = (i+k) % n
            if l2[id1] > l1[i]:
                curr += 200
            if l2[id1] < l1[i]:
                curr -= 200
        max1 = max(curr, max1)
    print(max1)
n = int(input())
```

基本信息

#: 47190464

题目: 02287

提交人: 24n2400012440徐嘉期

内存: 4612kB

时间: 13282ms

语言: Python3

提交时间: 2024-11-16 00:26:41

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English 帮助 关于

2. 学习总结和收获

如果作业题目简单，有否额外练习题目，比如：OJ“计概2024fall每日选做”、CF、LeetCode、洛谷等网站题目。

AK去年期末考题目，感觉greedy和dp最近做的少了，特别是greedy很难想到