Assignment #8: 田忌赛马来了

Updated 1021 GMT+8 Nov 12, 2024

2024 fall, Complied by 李振硕 、信息管理系

1. 题目

12558: 岛屿周长

matices, http://cs101.openjudge.cn/practice/12558/

思路：

发现了岛屿的周长等于每个1部分×4−同时在左右上下有的1的个数×2

代码：

状态: Accepted

源代码

```
n,m=map(int,input().split())
data=[]
same_point=0
point_dao=0
for i in range(n):
    dao_info=list(map(int,input().split()))
    data.append(dao_info)
for j in range(n):
    for l in range(m):
        if data[j][l]==1:
            point_dao+=1
            if j+2<=n:
                if data[j+1][l]==1:
                    same_point+=1
            if l+2<=m:
                if data[j][l+1]==1:
                    same_point+=1
all_zhouchang=point_dao*4-2*same_point
print(all_zhouchang)
```

基本信息

#: 47206014
题目: 12558
提交人: 24n2300093007
内存: 3672kB
时间: 26ms
语言: Python3
提交时间: 2024-11-16 18:53:32

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：

状态: Accepted

源代码

```
def generate_spiral_matrix(n):
    matrix = [[0] * n for _ in range(n)]
    num, x, y = 1, 0, 0
    directions = [(0, 1), (1, 0), (0, -1), (-1, 0)]
    direction_index = 0

    for _ in range(n * n):
        matrix[x][y] = num
        num += 1
        next_x, next_y = x + directions[direction_index][0], y + direct

        if not (0 <= next_x < n and 0 <= next_y < n and matrix[next_x][
            direction_index = (direction_index + 1) % 4
            next_x, next_y = x + directions[direction_index][0], y + di

        x, y = next_x, next_y

    return matrix

n = int(input())
spiral_matrix = generate_spiral_matrix(n)

for row in spiral_matrix:
    print(" ".join(map(str, row)))
```

基本信息

#: 47246205
题目: 18106
提交人: 24n2300093007
内存: 3640kB
时间: 39ms
语言: Python3
提交时间: 2024-11-18 19:50:15

English 帮助 关于

```python
def generate_spiral_matrix(n):
    matrix = [[0] * n for _ in range(n)]
    num, x, y = 1, 0, 0
    directions = [(0, 1), (1, 0), (0, -1), (-1, 0)]
    direction_index = 0

    for _ in range(n * n):
        matrix[x][y] = num
        num += 1
        next_x, next_y = x + directions[direction_index][0], y + directions[direction_index][1]

        if not (0 <= next_x < n and 0 <= next_y < n and matrix[next_x][next_y] == 0):
            direction_index = (direction_index + 1) % 4
            next_x, next_y = x + directions[direction_index][0], y + directions[direction_index][1]

        x, y = next_x, next_y

    return matrix

n = int(input())
spiral_matrix = generate_spiral_matrix(n)

for row in spiral_matrix:
    print(" ".join(map(str, row)))
```

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：


状态: Accepted

源代码

```
d = int(input())
n = int(input())

data = []
for _ in range(n):
    x, y, i = map(int, input().split())
    data.append((x, y, i))

max_garbage = 0
best_locations = []

for i1 in range(1025):
    for i2 in range(1025):
        all_trash = 0

        # 遍历每个垃圾点来计算是否在当前(i1, i2)点的爆炸范围内
        for x, y, garbage in data:
            if abs(x - i1) <= d and abs(y - i2) <= d:
                all_trash += garbage

        if all_trash > max_garbage:
            max_garbage = all_trash
            best_locations = [(i1, i2)]
        elif all_trash == max_garbage:
            best_locations.append((i1, i2))

print(len(best_locations), max_garbage)
```

基本信息

#: 47207378
题目: 04133
提交人: 24n2300093007
内存: 53528kB
时间: 1088ms
语言: Python3
提交时间: 2024-11-16 20:04:22

English 帮助 关

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：

状态：Accepted

源代码

```
n = int(input())
num = list(map(int, input().split()))
k = 1  # 初始化为 1，因为一个元素的序列是有效的摆动序列

i = 0
while i < n - 1:
    if num[i] < num[i + 1]:  # 检查上升
        k += 1
        while i < n - 1 and num[i] <= num[i + 1]:
            i += 1
    elif num[i] > num[i + 1]:  # 检查下降
        k += 1
        while i < n - 1 and num[i] >= num[i + 1]:
            i += 1
    else:
        i += 1

print(k)
```

基本信息

#:	47208314
题目:	26976
提交人:	24n2300093007
内存:	3676kB
时间:	26ms
语言:	Python3
提交时间:	2024-11-16 20:54:13

CF455A: Boredom

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

思路：

花时：187 ms

代码

By sot10130, contest: Codeforces Round 260 (Div. 1), problem: (A) Boredom, Accepted, #, Copy

```
n = int(input())
num = list(map(int, input().split()))

max_num = 10**5
count = [0] * (max_num + 1)

for x in num:
    count[x] += 1

dp = [0] * (max_num + 1)
dp[1] = count[1]

for i in range(2, max_num + 1):
    dp[i] = max(dp[i - 1], dp[i - 2] + i * count[i])

print(dp[max_num])
```

代码运行截图 <mark>（至少包含有"Accepted"）</mark>

02287: Tian Ji -- The Horse Racing

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

思路：

代码：

状态: Accepted

源代码

```
def maximum_earnings(n, tian_speeds, king_speeds):
    tian_speeds.sort()
    king_speeds.sort()

    left_tian = 0
    left_king = 0
    right_tian = n - 1
    right_king = n - 1
    earnings = 0

    while left_tian <= right_tian:
        if tian_speeds[right_tian] > king_speeds[right_king]:
            earnings += 200
            right_tian -= 1
            right_king -= 1
        elif tian_speeds[left_tian] > king_speeds[left_king]:
            earnings += 200
            left_tian += 1
            left_king += 1
        else:
            if tian_speeds[left_tian] < king_speeds[right_king]:
                earnings -= 200
            left_tian += 1
            right_king -= 1

    return earnings

while True:
    n = int(input())
    if n == 0:
        break
    tian_speeds = list(map(int, input().split()))
    king_speeds = list(map(int, input().split()))

    result = maximum_earnings(n, tian_speeds, king_speeds)
    print(result)
```

基本信息

#: 47246851
题目: 02287
提交人: 24n2300093007
内存: 3840kB
时间: 55ms
语言: Python3
提交时间: 2024-11-18 20:08:53

English 帮助

代码运行截图 <mark>（至少包含有"Accepted"）</mark>

2. 学习总结和收获

除了三道题，都很难。。dp部分学了好多次还不会。这周要花大量的时间复习dp部分。。