

Assignment #8: 田忌赛马来了

Updated 1021 GMT+8 Nov 12, 2024

2024 fall, Compiled by 洪千濠 工学院

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：耗时20分钟

代码：

```
n,m = map(int,input().split())
l = [[0]*(m+2)] + [[0] + list(map(int,input().split())) + [0] for _ in range(n)] + [[0]*(m+2)]
ans = 0
for i in range(1,n+1):
    for j in range(1, m + 1):
        if l[i][j] == 1:
            ans += 4 - l[i+1][j] - l[i][j+1] - l[i-1][j] - l[i][j-1]
print(ans)
```

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```
n,m = map(int,input().split())
l = [[0]*(m+2)] + [[0] + list(map(int,input().split())) + [0] for _ in range(n)]
ans = 0
for i in range(1,n+1):
    for j in range(1, m + 1):
        if l[i][j] == 1:
            ans += 4 - l[i+1][j] - l[i][j+1] - l[i-1][j] - l[i][j-1]
```

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: 耗时1h

代码:

```
n = int(input())
s = [[401]*(n+2)]
mx = s + [[401] + [0]*n + [401] for _ in range(n)] + s

dirL = [[0,1], [1,0], [0,-1], [-1,0]]

row = 1
col = 1
N = 0
drow, dcol = dirL[0]

for j in range(1, n*n+1):
    mx[row][col] = j
    if mx[row+drow][col+dcol]:
        N += 1
        drow, dcol = dirL[N%4]

    row += drow
    col += dcol

for i in range(1, n+1):
    print(' '.join(map(str, mx[i][1:-1])))
```

代码运行截图 == (至少包含有"Accepted") ==

状态: Accepted

源代码

```
n = int(input())
s = [[401]*(n+2)]
mx = s + [[401] + [0]*n + [401] for _ in range(n)] + s

dirL = [[0,1], [1,0], [0,-1], [-1,0]]

row = 1
col = 1
n = n
```

04133:垃圾炸弹

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

思路: 耗时40分钟

代码:

```
d = int(input())
n = int(input())
square = [[0]*1025 for _ in range(1025)]
for _ in range(n):
    x, y, k = map(int, input().split())
    #for i in range(x-d if x-d >= 0 else 0, x+d+1 if x+d <= 1024 else 1025):
    #for j in range(y-d if y-d >= 0 else 0, y+d+1 if y+d <= 1024 else 1025):
    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)):
            square[i][j] += k

res = max_point = 0
for i in range(0, 1025):
    for j in range(0, 1025):
        if square[i][j] > max_point:
            max_point = square[i][j]
            res = 1
        elif square[i][j] == max_point:
            res += 1
print(res, max_point)
```

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```
d = int(input())
n = int(input())
square = [[0]*1025 for _ in range(1025)]
for _ in range(n):
    x, y, k = map(int, input().split())
    #for i in range(x-d if x-d >= 0 else 0, x+d+1 if x+d <= 1025 else 1025):
    #for j in range(y-d if y-d >= 0 else 0, y+d+1 if y+d <= 1025 else 1025):
    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)):
            square[i][j] += k

res = max_point = 0
for i in range(0, 1025):
    for j in range(0, 1025):
        res = max(res, square[i][j])
```

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: 耗时3h

代码:

```
def sgn(x):
    if x == 0:
        return 0
    elif x > 0:
        return 1
    elif x < 0:
        return -1

n = int(input())
nums = list(map(int, input().split()))
delta = [sgn(nums[i+1]-nums[i]) for i in range(n-1)]

result = 1
pre = 0
for i in range(n-1):
    if delta[i] * pre < 0 or (pre == 0 and delta[i] != 0):
        result += 1
    pre = delta[i]
print(result)
```

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```
def sgn(x):
    if x == 0:
        return 0
    elif x > 0:
        return 1
    elif x < 0:
```

CF455A: Boredom

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

思路: 耗时2h

代码:

```
n = int(input())
arr = list(map(int, input().split()))
dp = [0] * (max(arr) + 1)
cnt = [0] * (max(arr) + 1)
for each in arr:
    cnt[each] += 1

dp[0] = 0
dp[1] = cnt[1]
for i in range(2, max(arr) + 1):
    dp[i] = max(dp[i-1], dp[i-2] + cnt[i] * i)

print(max(dp))
```

代码运行截图 (至少包含有"Accepted")

291885993	Nov/17/2024 12:53 UTC+8	Slivahong01	A - Boredom	Python 3	Accepted	171 ms	13100 KB
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02287: Tian Ji -- The Horse Racing

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

思路: 耗时6h

代码:

```
for _ in range(50):
```

```

n = int(input())
if n==0:
    break
A = [[], []]
for _ in range(n):
    for x in input().split():
        A[0].append(int(x))
    if len(A[0]) == n:
        break
for _ in range(n):
    for y in input().split():
        A[1].append(int(y))
    if len(A[1]) == n:
        break

A[0].sort(reverse=True)
A[1].sort(reverse=True)

answer = 0

for _ in range(n):
    if A[0][0] > A[1][0]:
        answer += 1
        del A[0][0]
        del A[1][0]
    else:
        if A[0][-1] > A[1][-1]:
            answer += 1
            del A[0][-1]
            del A[1][-1]
        else:
            if A[0][-1] < A[1][0]:
                answer -= 1
            del A[0][-1]
            del A[1][0]

print(200*answer)

```

田忌赛马这个题目，测试数据更新过，已经不用这么复杂来接收。常用读入数据的方法就可以。

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```
for _ in range(50):
    n = int(input())
    if n==0:
        break
    A = [[], []]
    for _ in range(n):
        for x in input().split():
            A[0].append(int(x))
        if len(A[0]) == n:
            break
    for _ in range(n):
```

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。

已经开始跟每日选做，感觉思路越来越清晰了，有时候也能想到极佳的思路，很开心，感觉找回了一开始做题的那种快乐，高歌猛进，继续加油!!!