Assignment #C: 五味杂陈

Updated 1148 GMT+8 Dec 10, 2024
2024 fall, Complied by 魏佳亮 物院
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

1115. 取石子游戏

dfs, https://www.acwing.com/problem/content/description/1117/
思路：while循环，模拟对弈过程
代码：

```
while True:
    m,n = map(int,input().split())
    if (m,n) == (0,0):
        break
    ans = 0
    while max(m,n) // min(m,n) < 2:
        if m == n:
            break
        elif m < n:
            n -= m
        else:
            m -= n
        ans += 1
    if ans % 2 == 0:
        print('win')
    else:
        print('lose')
```

代码运行截图 （至少包含有"Accepted"）

```python
while True:
    m,n = map(int,input().split())
    if (m,n) == (0,0):
        break
    ans = 0
    while max(m,n) // min(m,n) < 2:
        if m == n:
            break
        elif m < n:
            n -= m
        else:
            m -= n
        ans += 1
    if ans % 2 == 0:
        print('win')
    else:
        print('lose')
```

数据有点弱吗？可以申请加强数据

调试代码 提交答案

代码提交状态：Accepted

25570: 洋葱

Matrices, http://cs101.openjudge.cn/practice/25570
思路：语法题
代码：

```
n = int(input())
l = [list(map(int,input().split())) for _ in range(n)]
print(max(sum(l[i][i:n-i])+sum(l[n-i-1][i:n-i])*[0,1][i != (n-1)/2]+sum(l[j][i]+l[j][n-i-1] for j in range(i+1,n-i-1)) for i in range((n+1)//2)))
```

代码运行截图 ==（至少包含有"Accepted"）==

#47686908提交状态 查看 提交 统计 提问

状态: Accepted

源代码

```
n = int(input())
l = [list(map(int,input().split())) for _ in range(n)]
print(max(sum(l[i][i:n-i])+sum(l[n-i-1][i:n-i])*[0,1][i != (n-1)/2]+sum
```

基本信息

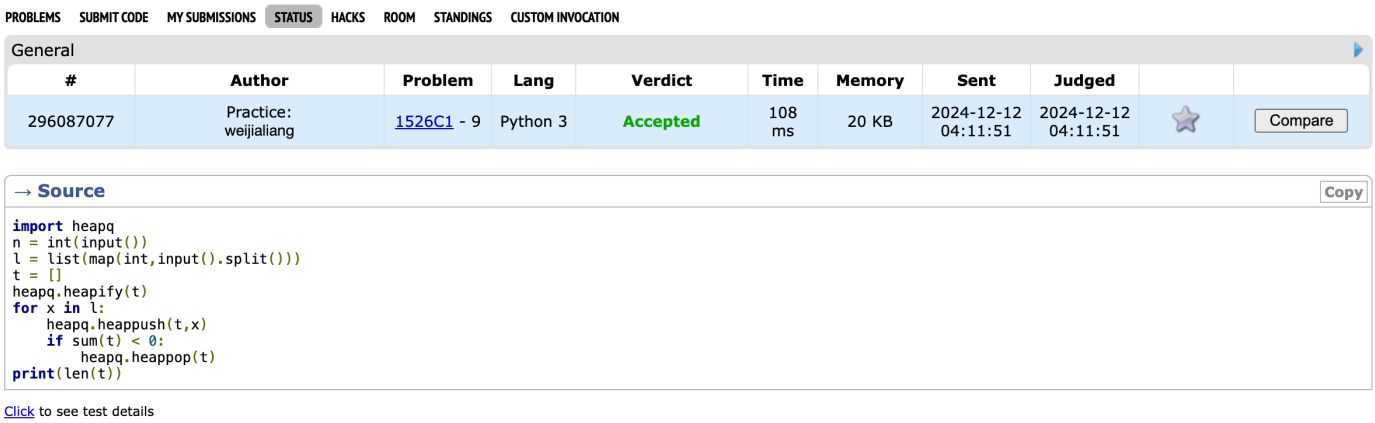
#:	47686908
题目:	25570
提交人:	2400011474
内存:	3904kB
时间:	25ms
语言:	Python3
提交时间:	2024-12-11 18:25:34

1526C1. Potions(Easy Version)

greedy, dp, data structures, brute force, *1500, https://codeforces.com/problemset/problem/1526/C1
思路：heapq语法题，虽然最开始没想出来
代码：

```
import heapq
n = int(input())
l = list(map(int,input().split()))
t = []
heapq.heapify(t)
for x in l:
    heapq.heappush(t,x)
    if sum(t) < 0:
        heapq.heappop(t)
print(len(t))
```

代码运行截图 （至少包含有"Accepted"）



PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS HACKS ROOM STANDINGS CUSTOM INVOCATION

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
296087077	Practice: weijialiang	1526C1 - 9	Python 3	Accepted	108 ms	20 KB	2024-12-12 04:11:51	2024-12-12 04:11:51		Compare

→ Source Copy

```
import heapq
n = int(input())
l = list(map(int,input().split()))
t = []
heapq.heapify(t)
for x in l:
    heapq.heappush(t,x)
    if sum(t) < 0:
        heapq.heappop(t)
print(len(t))
```

Click to see test details

22067: 快速堆猪

辅助栈，http://cs101.openjudge.cn/practice/22067/
思路：辅助栈语法题
代码：

```
from collections import deque
import heapq
k = [float('inf')]
heapq.heapify(k)
l = deque([])
while True:
    try:
        t = input()
        if t[1] == 'o':
            if l:
                a = l.pop()
                b = heapq.heappop(k)
                if b != a:
                    heapq.heappush(k,b)
        elif t[1] == 'u':
            t = t.split()
            l.append(int(t[-1]))
            b = heapq.heappop(k)
            if int(t[-1]) <= b:
                heapq.heappush(k,int(t[-1]))
```

```
            heapq.heappush(k,b)
        else:
            if l:
                b = heapq.heappop(k)
                print(b)
                heapq.heappush(k,b)
    except EOFError:
        break
```

代码运行截图 （至少包含有"Accepted"）

#47695524提交状态

查看 提交 统计 提问

状态: Accepted

源代码

```
from collections import deque
import heapq
k = [float('inf')]
heapq.heapify(k)
l = deque([])
while True:
    try:
        t = input()
        if t[1] == 'o':
            if l:
                a = l.pop()
                b = heapq.heappop(k)
                if b != a:
                    heapq.heappush(k,b)
        elif t[1] == 'u':
            t = t.split()
            l.append(int(t[-1]))
            b = heapq.heappop(k)
            if int(t[-1]) <= b:
                heapq.heappush(k,int(t[-1]))
            heapq.heappush(k,b)
        else:
            if l:
                b = heapq.heappop(k)
                print(b)
                heapq.heappush(k,b)
    except EOFError:
        break
```

基本信息

#: 47695524
题目: 22067
提交人: 2400011474
内存: 7444kB
时间: 344ms
语言: Python3
提交时间: 2024-12-12 10:02:36

20106: 走山路

Dijkstra, http://cs101.openjudge.cn/practice/20106/
思路：算法模版，之前没见过
代码：

```
import heapq
import copy
n,m,p = list(map(int,input().split()))
w = []
for _ in range(n):
    t = input().split()
    for i in range(m):
        if t[i].isnumeric():
            t[i] = int(t[i])
```

```
    w.append(t)
q = [[-1,0],[1,0],[0,-1],[0,1]]
for _ in range(p):
    a,b,c,d = list(map(int,input().split()))
    l = [copy.copy(x) for x in w]
    if l[a][b] == '#' or l[c][d] == '#':
        print('NO')
    else:
        ans = [(0,a,b)]
        heapq.heapify(ans)
        t = False
        while ans:
            r = heapq.heappop(ans)
            if r[1] == c and r[2] == d:
                print(r[0])
                t = True
                break
            if l[r[1]][r[2]] != '#':
                for y in q:
                    if 0 <= r[1]+y[0] < n and 0 <= r[2]+y[1] < m and l[r[1]+y[0]]
[r[2]+y[1]] != '#':
                        heapq.heappush(ans,(r[0]+abs(l[r[1]+y[0]][r[2]+y[1]]-l[r[1]]
[r[2]]),r[1]+y[0],r[2]+y[1]))
                l[r[1]][r[2]] = '#'
        if not t:
            print('NO')
```

代码运行截图 （至少包含有"Accepted"）

#47736811提交状态

查看 提交 统计 提问

状态: Accepted

源代码

```
import heapq
import copy
n,m,p = list(map(int,input().split()))
w = []
for _ in range(n):
    t = input().split()
    for i in range(m):
        if t[i].isnumeric():
            t[i] = int(t[i])
    w.append(t)
q = [[-1,0],[1,0],[0,-1],[0,1]]
for _ in range(p):
    a,b,c,d = list(map(int,input().split()))
    l = [copy.copy(x) for x in w]
    if l[a][b] == '#' or l[c][d] == '#':
        print('NO')
    else:
        ans = [(0,a,b)]
        heapq.heapify(ans)
        t = False
        while ans:
            r = heapq.heappop(ans)
            if r[1] == c and r[2] == d:
                print(r[0])
                t = True
                break
            if l[r[1]][r[2]] != '#':
                for y in q:
                    if 0 <= r[1]+y[0] < n and 0 <= r[2]+y[1] < m and l[
                        heapq.heappush(ans,(r[0]+abs(l[r[1]+y[0]][r[2]+
                l[r[1]][r[2]] = '#'
        if not t:
            print('NO')
```

基本信息

#: 47736811
题目: 20106
提交人: 2400011474
内存: 3736kB
时间: 265ms
语言: Python3
提交时间: 2024-12-14 17:14:48

04129: 变换的迷宫

bfs, http://cs101.openjudge.cn/practice/04129/

思路：bfs，也是看了群里面聊天记录才知道要有一个记录时间的矩阵，开始我把这个矩阵放在了deque里面，mle了，后来才反应过来可以做一个全局变量

代码：

```
from collections import deque
import copy
t = int(input())
for _ in range(t):
    r,c,k = map(int,input().split())
    l = []
    for i in range(r):
        t = list(input())
        if 'S' in t:
            [x1,y1] = [i,t.index('S')]
        if 'E' in t:
            [x2,y2] = [i,t.index('E')]
        l.append(t)
    t = [[[] for _ in range(c)] for _ in range(r)]
    d = [[0,-1],[0,1],[-1,0],[1,0]]
```

```
    t[x1][y1].append(0)
    ans = deque([[0,x1,y1]])
    p = False
    while ans:
        s = ans.popleft()
        if s[1] == x2 and s[2] == y2:
            print(s[0])
            p = True
            break
        for x in d:
            if 0 <= s[1]+x[0] < r and 0 <= s[2]+x[1] < c and (l[s[1]+x[0]][s[2]+x[1]] !=
'#' or (s[0]+1) % k == 0) and all((s[0]+1-x) % k != 0 for x in t[s[1]+x[0]][s[2]+x[1]]):
                t[s[1]+x[0]][s[2]+x[1]].append(s[0]+1)
                ans.append([s[0]+1,s[1]+x[0],s[2]+x[1]])
    if not p:
        print('Oop!')
```

代码运行截图 （至少包含有"Accepted"）

#47745475提交状态 查看 提交 统计 提问

状态: Accepted

源代码

```
from collections import deque
import copy
t = int(input())
for _ in range(t):
    r,c,k = map(int,input().split())
    l = []
    for i in range(r):
        t = list(input())
        if 'S' in t:
            [x1,y1] = [i,t.index('S')]
        if 'E' in t:
            [x2,y2] = [i,t.index('E')]
        l.append(t)
    t = [[[] for _ in range(c)] for _ in range(r)]
    d = [[0,-1],[0,1],[-1,0],[1,0]]
    t[x1][y1].append(0)
    ans = deque([[0,x1,y1]])
    p = False
    while ans:
        s = ans.popleft()
        if s[1] == x2 and s[2] == y2:
            print(s[0])
            p = True
            break
        for x in d:
            if 0 <= s[1]+x[0] < r and 0 <= s[2]+x[1] < c and (l[s[1]+x[
                t[s[1]+x[0]][s[2]+x[1]].append(s[0]+1)
                ans.append([s[0]+1,s[1]+x[0],s[2]+x[1]])
    if not p:
        print('Oop!')
```

基本信息

#:	47745475
题目:	04129
提交人:	2400011474
内存:	4556kB
时间:	225ms
语言:	Python3
提交时间:	2024-12-15 10:53:31

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。

期末季，每日选做已经荒废了，这次作业好难，后两个题自己都做不出来，辅助栈也是，希望机考能考些容易想到的小trick