

Assignment #10: dp & bfs

Updated 2 GMT+8 Nov 25, 2024
2024 fall, Compiled by 同学的姓名、院系

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

LuoguP1255 数楼梯

dp, bfs, <https://www.luogu.com.cn/problem/P1255>
思路：dp
代码：

```
n = int(input())
l = [1 for _ in range(n+1)]
for i in range(2,n+1):
    l[i] = l[i-1]+l[i-2]
print(l[n])
```

代码运行截图（至少包含有"Accepted"）

测试点信息源代码

测试点信息

#1 AC 15ms/3.71MB	#2 AC 15ms/3.73MB	#3 AC 16ms/3.65MB	#4 AC 16ms/3.64MB	#5 AC 16ms/3.72MB	#6 AC 16ms/3.70MB	#7 AC 16ms/3.75MB
#8 AC 16ms/3.70MB	#9 AC 16ms/3.95MB	#10 AC 18ms/4.95MB				

wjl2400011474

所属题目

P1255 数楼梯

评测状态

Accepted

评测分数

100

提交时间

2024-11-26 18:56:29

27528: 跳台阶

dp, <http://cs101.openjudge.cn/practice/27528/>
思路：dp
代码：

```
n = int(input())
l = [1 for _ in range(n+1)]
for i in range(2,n+1):
    l[i] = sum(l[:i])
print(l[n])
```

代码运行截图 == (至少包含有"Accepted") ==

#47412553提交状态

[查看](#) [提交](#) [统计](#) [提问](#)

状态: **Accepted**

源代码

```
n = int(input())
l = [1 for _ in range(n+1)]
for i in range(2,n+1):
    l[i] = sum(l[:i])
print(l[n])
```

基本信息

#: 47412553
 题目: 27528
 提交人: 2400011474
 内存: 3628kB
 时间: 33ms
 语言: Python3
 提交时间: 2024-11-26 19:04:02

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[English](#) [帮助](#) [关于](#)

474D. Flowers

dp, <https://codeforces.com/problemset/problem/474/D>

思路: dp加一些优化 (不要用sum)

代码:

```
t,k = map(int,input().split())
l = []
for _ in range(t):
    l.append(list(map(int,input().split())))
m = max([x[1] for x in l])
t = [1 for _ in range(m+1)]
if k <= m:
    t[k] = 2
    for i in range(min(k+1,m),min(2*k,m+1)):
        t[i] = (t[i-1]+2*t[i-k]-t[i-k-1])%1000000007
    for i in range(min(2*k,m+1),m+1):
        t[i] = (t[i-1]+2*t[i-k]-t[i-k-1]-t[i-2*k])%1000000007
ans = 0
t[0] = 0
for i in range(1,m+1):
    ans += t[i]
    ans = ans%1000000007
    t[i] = ans
for x in l:
    print((t[x[1]]-t[x[0]-1])%1000000007)
```

代码运行截图 (至少包含有"Accepted")

General										
#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
293363133	Practice: weijialiang	474D - 15	Python 3	Accepted	577 ms	23488 KB	2024-11-26 16:18:38	2024-11-26 16:18:38	★	<button>Compare</button>

→ Source Copy

```

t,k = map(int,input().split())
l = []
for _ in range(t):
    l.append(list(map(int,input().split())))
m = max([x[1] for x in l])
t = [1 for _ in range(m+1)]
if k <= m:
    t[k] = 2
    for i in range(min(k+1,m),min(2*k,m+1)):
        t[i] = (t[i-1]+2*t[i-k]-t[i-k-1])%1000000007
    for i in range(min(2*k,m+1),m+1):
        t[i] = (t[i-1]+2*t[i-k]-t[i-k-1]-t[i-2*k])%1000000007
ans = 0
t[0] = 0
for i in range(1,m+1):
    ans += t[i]
    ans = ans%1000000007
    t[i] = ans
for x in l:
    print((t[x[1]]-t[x[0]-1])%1000000007)

```

[Click](#) to see test details

LeetCode5.最长回文子串

dp, two pointers, string, <https://leetcode.cn/problems/longest-palindromic-substring/>

思路：直接暴力，没想到能过，正常N^2应该就可以

代码：

```

class Solution:
    def longestPalindrome(self, s: str) -> str:
        ans = 1
        k = 0
        for i in range(len(s)):
            if i+ans > len(s):
                break
            for j in range(i+ans,len(s)+1):
                if s[i:j] == s[i:j][::-1]:
                    ans = j-i
                    k = s[i:j]
        return k

```

代码运行截图 (至少包含有"Accepted")

通过

提交于 2024.11.27 17: 官方题解 写题解

「感恩季」限时福利!
PLUS 买 1 得 2 同时可享力扣 365 天 Plus ...

执行用时分布
4497 ms | 击败 8.62%
[复杂度分析](#)

消耗内存分布
17.07 MB | 击败 52.82%

```

1 class Solution:
2     def longestPalindrome(self, s: str) -> str:
3         ans = 1
4         k = 0
5         for i in range(len(s)):
6             if i+ans > len(s):
7                 break
8             for j in range(i+ans, len(s)+1):
9                 if s[i:j] == s[i:j][::-1]:
10                    ans = j-i
11                    k = s[i:j]
12         return k
13

```

已存储

行 8, 列 26

测试用例 | 测试结果

Case 1 Case 2 +

s =

"babad"

12029: 水淹七军

bfs, dfs, <http://cs101.openjudge.cn/practice/12029/>

思路：dfs，最开始甚至因不信邪按正常方式输入，最后破防了只能改输入方式然后就过了

代码：

```

import sys
input = sys.stdin.read
data = input().split()
result = []
k=int(data[0])
idx = 1
for _ in range(k):
    m,n = map(int,data[idx:idx+2])
    idx += 2
    l = [[float('inf')]*(n+2)]
    for _ in range(m):
        l.append([float('inf')]+list(map(int,data[idx:idx+n]))+[float('inf')])
        idx += n
    l.append([float('inf')]*(n+2))
    c = [[False for _ in range(n+2)] for _ in range(m+2)]
    i,j = map(int,data[idx:idx+2])
    idx += 2
    p = int(data[idx])
    idx += 1
    d = [(-1,0),(1,0),(0,-1),(0,1)]
    t = []
    for _ in range(p):
        x = list(map(int,data[idx:idx+2]))
        idx += 2
        ans = [x]
        h = l[x[0]][x[1]]
        while ans:
            z = ans.pop()
            for y in d:

```

```

        if l[z[0]+y[0]][z[1]+y[1]] < h:
            ans.append([z[0]+y[0],z[1]+y[1]])
            l[z[0]+y[0]][z[1]+y[1]] = h
            c[z[0]+y[0]][z[1]+y[1]] = True

    if c[i][j]:
        result.append('Yes')
    else:
        result.append('No')
sys.stdout.write('\n' .join(result)+'\n')

```

代码运行截图 (至少包含有"Accepted")

#47408525提交状态

查看 提交 统计 提问

状态: Accepted

源代码

```

import sys
input = sys.stdin.read
data = input().split()
result = []
k=int(data[0])
idx = 1
for _ in range(k):
    m,n = map(int,data[idx:idx+2])
    idx += 2
    l = [[float('inf')]*(n+2)]
    for _ in range(m):
        l.append([float('inf')]+list(map(int,data[idx:idx+n]))+[float('inf')])
        idx += n
    l.append([float('inf')]*(n+2))
    c = [[False for _ in range(n+2)] for _ in range(m+2)]
    i,j = map(int,data[idx:idx+2])
    idx += 2
    p = int(data[idx])
    idx += 1
    d = [(-1,0),(1,0),(0,-1),(0,1)]
    t = []
    for _ in range(p):
        x = list(map(int,data[idx:idx+2]))
        idx += 2
        ans = [x]
        h = l[x[0]][x[1]]
        while ans:
            z = ans.pop()
            for y in d:
                if l[z[0]+y[0]][z[1]+y[1]] < h:
                    ans.append([z[0]+y[0],z[1]+y[1]])
                    l[z[0]+y[0]][z[1]+y[1]] = h
                    c[z[0]+y[0]][z[1]+y[1]] = True
        if c[i][j]:

```

基本信息

#: 47408525
 题目: 12029
 提交人: 2400011474
 内存: 6536kB
 时间: 236ms
 语言: Python3
 提交时间: 2024-11-26 16:12:07

02802: 小游戏

bfs, <http://cs101.openjudge.cn/practice/02802/>

思路: 这题我是真写破防了, 各种条件判断+剪枝, 还需要深拷贝, 逻辑过于复杂

代码:

```

from collections import deque
import copy
d = [(-1,0),(0,-1),(0,1),(1,0)]
p = 1

```

```

while True:
    w,h = map(int,input().split())
    if w == 0 and h == 0:
        break
    if p != 1:
        print('')
    print(f'Board #{p}:')
    l = [[' ']*(w+2)]+[[' ']+list(input())+[' ']] for _ in range(h)+[[' ']*(w+2)]
    q = 1
    while True:
        x1,y1,x2,y2 = map(int,input().split())
        if x1 == 0 and y1 == 0 and x2 == 0 and y2 == 0:
            break
        if x1 == x2 and y1 == y2:
            print(f'Pair {q}: 0 segments.')
            q += 1
            continue
        k = [[True for _ in range(w+2)] for _ in range(h+2)]
        ans = deque([[y1,x1,-1,0,k]])
        f = False
        while ans:
            x = ans.popleft()
            for i in range(4):
                y = d[i]
                if x[0] == y2 and x[1] == x2:
                    print(f'Pair {q}: {x[3]} segments.')
                    f = True
                    break
                if i+x[2] != 3 and 0 <= y[0]+x[0] < h+2 and 0 <= y[1]+x[1] < w+2 and
(1[y[0]+x[0]][y[1]+x[1]] == ' ' or y[0]+x[0] == y2 and y[1]+x[1] == x2) and x[4]
[y[0]+x[0]][y[1]+x[1]]:
                    r = [copy.copy(m) for m in x[4]]
                    r[y[0]+x[0]][y[1]+x[1]] = False
                    if x[2] == i:
                        ans.appendleft([y[0]+x[0],y[1]+x[1],i,x[3],r])
                    else:
                        ans.append([y[0]+x[0],y[1]+x[1],i,x[3]+1,r])
            if f:
                break
        if not f:
            print(f'Pair {q}: impossible.')
        q += 1
    p += 1

```

代码运行截图 (至少包含有"Accepted")

状态: **Accepted**

源代码

```
from collections import deque
import copy
d = [(-1,0), (0,-1), (0,1), (1,0)]
p = 1
while True:
    w,h = map(int,input().split())
    if w == 0 and h == 0:
        break
    if p != 1:
        print('')
    print(f'Board #{p}:')
    l = [[' ']*(w+2)]+[[' ']+list(input())+[' ']] for _ in range(h)+[[' ']]
    q = 1
    while True:
        x1,y1,x2,y2 = map(int,input().split())
        if x1 == 0 and y1 == 0 and x2 == 0 and y2 == 0:
            break
        if x1 == x2 and y1 == y2:
            print(f'Pair {q}: 0 segments.')
            q += 1
            continue
        k = [[True for _ in range(w+2)] for _ in range(h+2)]
        ans = deque([[y1,x1,-1,0,k]])
        f = False
        while ans:
            x = ans.popleft()
```

基本信息

#: 47424625
题目: 02802
提交人: 2400011474
内存: 4524kB
时间: 435ms
语言: Python3
提交时间: 2024-11-27 14:34:36

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。

小游戏好难啊，写了得三个小时，每日选做跟着呢，还能跟上，这次作业难度方差有亿点点大（