

# Assignment #D: May月考

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Updated 1654 GMT+8 May 8, 2024

2024 spring, Compiled by 李鹏辉, 元培学院

## 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。

## 编程环境

Windows 10 Home, PyCharm 2022.3.2 (Community Edition)

操作系统: macOS Ventura 13.4.1 (c)

Python编程环境: Spyder IDE 5.2.2, PyCharm 2023.1.4 (Professional Edition)

C/C++编程环境: Mac terminal vi (version 9.0.1424), g++/gcc (Apple clang version 14.0.3, clang-1403.0.22.14.1)

## 1. 题目

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### 02808: 校门外的树

<http://cs101.openjudge.cn/practice/02808/>

思路: 5 mins.

代码

```

1  def q1():
2      l, m = map(int, input().split())
3      s = set(range(0, l+1))
4      for _ in range(m):
5          a, b = map(int, input().split())
6          for i in range(a, b+1):
7              if i in s:
8                  s.remove(i)
9      print(len(s))
10
11
12  q1()

```

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```

def q1():
    l, m = map(int, input().split())
    s = set(range(0, l+1))
    for _ in range(m):
        a, b = map(int, input().split())
        for i in range(a, b+1):
            if i in s:
                s.remove(i)
    print(len(s))

```

基本信息

#: 44965512  
 题目: 02808  
 提交人: 2100017777  
 内存: 4384kB  
 时间: 40ms  
 语言: Python3  
 提交时间: 2024-05-14 23:05:01

## 20449: 是否被5整除

<http://cs101.openjudge.cn/practice/20449/>

思路: 7 mins.

代码

```

1  def q2():
2      s = [int(i) for i in input()]
3      re = ''
4      for i in range(len(s)):
5          ten = 0
6          for j in range(i+1):
7              ten += s[j] * (2 ** (i-j))
8          if not ten % 5:
9              re += '1'
10         else:
11             re += '0'
12     print(re)
13
14
15  q2()

```

代码运行截图 (至少包含有"Accepted")

状态: Accepted

源代码

```
def q2():
    s = [int(i) for i in input()]
    re = ''
    for i in range(len(s)):
        ten = 0
        for j in range(i+1):
```

基本信息

#: 44965603  
题目: 20449  
提交人: 2100017777  
内存: 3604kB  
时间: 21ms  
语言: Python3  
提交时间: 2024-05-14 23:12:42

## 01258: Agri-Net

<http://cs101.openjudge.cn/practice/01258/>

思路: 17 mins.

代码

```
1 import heapq
2
3
4 def q3():
5     try:
6         while True:
7             n = int(input())
8             g = []
9             for i in range(n):
10                 ds = list(map(int, input().split()))
11                 g.append(ds)
12             v = [False] * n
13             ds = [100001] * n
14             q = []
15             heapq.heappush(q, (0, 0))
16             ds[0] = 0
17             while q:
18                 d, cv = heapq.heappop(q)
19                 if v[cv]: continue
20                 v[cv] = True
21                 for i in range(n):
22                     if v[i]: continue
23                     if g[cv][i] < ds[i]:
24                         ds[i] = g[cv][i]
25                         heapq.heappush(q, (ds[i], i))
26             print(sum(ds))
27
28 except EOFError:
29     return
30
31
32 q3()
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

状态: Accepted

源代码

```
import heapq

def q3():
    try:
        while True:
```

基本信息

#: 45027694  
题目: 01258  
提交人: 2100017777  
内存: 3908kB  
时间: 28ms  
语言: Python3  
提交时间: 2024-05-20 19:48:17

## 27635: 判断无向图是否连通有无回路(同23163)

<http://cs101.openjudge.cn/practice/27635/>

思路: 15 mins if without compile errors.

代码

```
1 n, m = map(int, input().split())
2 p = [i for i in range(n)]
3
4 def find(i):
5     if p[i] != i:
6         p[i] = find(p[i])
7     return p[i]
8
9 def union(x, y):
10    p[find(x)] = find(y)
11
12 l = False
13 for _ in range(m):
14    x, y = map(int, input().split())
15    if find(x) == find(y):
16        l = True
17    else:
18        union(x, y)
19 p = [find(i) for i in range(n)]
20 p = set(p)
21 print('connected:yes' if len(p) == 1 else 'connected:no')
22 print('loop:yes' if l else 'loop:no')
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

状态: Accepted

源代码

```
# pylint: skip-file

n, m = map(int, input().split())
p = [i for i in range(n)]

def find(i):
```

基本信息

#: 45028929  
题目: 27635  
提交人: 2100017777  
内存: 3640kB  
时间: 27ms  
语言: Python3  
提交时间: 2024-05-20 21:13:49

## 27947: 动态中位数

<http://cs101.openjudge.cn/practice/27947/>

思路：限时内没有做出来，因为当时用了pop而非指针导致一直超时。

代码

```
1  import heapq
2
3  n = int(input())
4  for _ in range(n):
5      ns = list(map(int, input().split()))
6      cm = ns[0]
7      re = [ns[0]]
8      lt = []
9      mt = []
10     i = 1
11     heapq.heappush(mt, cm)
12     balance = 1
13
14     while len(ns) - i > 1:
15         a = ns[i]
16         b = ns[i+1]
17         x = min(a, b)
18         y = max(a, b)
19         if x > cm:
20             heapq.heappush(mt, x)
21             heapq.heappush(mt, y)
22             if balance == 1:
23                 heapq.heappush(lt, -heapq.heappop(mt))
24             balance = 1
25             cm = mt[0]
26         elif y < cm:
27             heapq.heappush(lt, -x)
28             heapq.heappush(lt, -y)
29             if balance == -1:
30                 heapq.heappush(mt, -heapq.heappop(lt))
31             balance = -1
32             cm = -lt[0]
33     else:
```

```
34         heapq.heappush(lt, -x)
35         heapq.heappush(mt, y)
36         re.append(cm)
37         i += 2
38     print(len(re))
39     print(' '.join(map(str, re)))
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

## 28190: 奶牛排队

<http://cs101.openjudge.cn/practice/28190/>

思路:

代码

```
1  #
2
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

## 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"2024spring每日选做"、CF、LeetCode、洛谷等网站题目。

pop比指针耗时更大; oj上用# pylint: skip-file跳过静态测试。