Assignment #D: May月考

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2024 spring, Complied by 郑铭毅 数学科学学院

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 typorahttps://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 11

PyCharm

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

02808: 校门外的树

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

思路:

代码

```
L,M=map(int,input().split())
l=[1]*(L+1)
for i in range(M):
    a,b=map(int,input().split())
    for j in range(a,b+1):
        l[j]=0
k=0
for i in range(L+1):
    if l[i]==1:
        k+=1
print(k)
```

代码运行截图

20449: 是否被5整除

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

思路:

代码

```
def f(s):
    return int(s,2)
s=input()
a=''
for i in range(len(s)):
    if f(s[0:i+1])%5==0:
        a+='1'
    else:
        a+='0'
print(a)
```

代码运行截图

01258: Agri-Net

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

思路:

代码

```
#

```

代码运行截图 （AC代码截图，至少包含有"Accepted"）

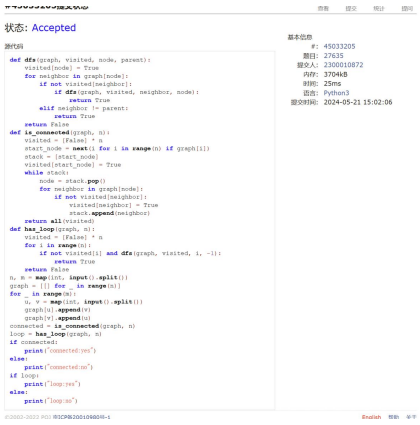
27635: 判断无向图是否连通有无回路(同23163)

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

思路:

代码

```
def dfs(graph, visited, node, parent):
    visited[node] = True
    for neighbor in graph[node]:
        if not visited[neighbor]:
            if dfs(graph, visited, neighbor, node):
                return True
        elif neighbor != parent:
            return True
    return False
def is_connected(graph, n):
    visited = [False] * n
    start_node = next(i for i in range(n) if graph[i])
    stack = [start_node]
    visited[start_node] = True
    while stack:
        node = stack.pop()
        for neighbor in graph[node]:
            if not visited[neighbor]:
                visited[neighbor] = True
                stack.append(neighbor)
    return all(visited)
def has_loop(graph, n):
    visited = [False] * n
    for i in range(n):
        if not visited[i] and dfs(graph, visited, i, -1):
            return True
    return False
n, m = map(int, input().split())
graph = [[] for _ in range(n)]
for _ in range(m):
    u, v = map(int, input().split())
    graph[u].append(v)
    graph[v].append(u)
connected = is_connected(graph, n)
loop = has_loop(graph, n)
if connected:
    print("connected:yes")
else:
    print("connected:no")
if loop:
    print("loop:yes")
else:
    print("loop:no")
```

代码运行截图 

27947: 动态中位数

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

思路:

代码

```
import heapq
def add_num(num,maxheap,minheap):
    if not maxheap or num <= -maxheap[0]:
        heapq.heappush(maxheap,-num)
    else:
        heapq.heappush(minheap,num)
    if len(maxheap)>len(minheap)+1:
        heapq.heappush(minheap,-heapq.heappop(maxheap))
    elif len(minheap)>len(maxheap):
        heapq.heappush(maxheap,-heapq.heappop(minheap))
T=int(input())
for _ in range(T):
    nums=[int(t) for t in input().split()]
    maxheap=[]
    minheap=[]
    midians=[]
    for i in range(len(nums)):
        add_num(nums[i],maxheap,minheap)
        if i%2==0:
            midians.append(-maxheap[0])
    print(len(midians))
    print(*midians)
```

代码运行截图

28190: 奶牛排队

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

思路:

代码

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```
#

```

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

两个小时只能AC3题，还需要加强练习