Assignment #7: April 月考

Updated 1557 GMT+8 Apr 3, 2024

2024 spring, Complied by Xinjie Song, Phy

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

操作系统：Windows 11 22H2

Python编程环境：PyCharm 2023.2 (Community Edition)

C/C++编程环境：g++ (x86_64-win32-seh-rev0, Built by MinGW-W64 project) 8.1.0

1. 题目

27706: 逐词倒放

http://cs101.openjudge.cn/practice/27706/

思路：懒得写栈了，直接反转

代码

```
ls = input().split()
ls.reverse()
print(' '.join(ls))
```

代码运行截图

CS101 / 20240403 cs201 2024 Mock Exam 已经结束

题目 排名 状态 统计 提问

#44515789提交状态

查看   提交   统计   提问

状态: Accepted

源代码

```
ls = input().split()
ls.reverse()
print(' '.join(ls))
```

基本信息

#: 44515789
题目: E27706
提交人: 23n2300011524
内存: 3560kB
时间: 27ms
语言: Python3
提交时间: 2024-04-03 15:08:59

27951: 机器翻译

http://cs101.openjudge.cn/practice/27951/

思路：队列

代码

```python
from queue import Queue

t = int(input())
groups = {}
search = {}
for i in range(t):
    ls = list(map(int, input().split()))
    groups[i] = ls
    for j in ls:
        search[j] = i
q = []
start = 0
l = 0
groups_in = {i: -1 for i in range(t)}

while True:
    s = input().split()
    if s[0][0] == 'S':
        break
    elif s[0][0] == 'D':
        print(q[start].get())
        if q[start].empty() == 1:
```

```
            start += 1
            l -= 1
    else:
        num = int(s[1])
        idx = search[num]
        i = groups_in[idx]
        if i - start >= 0:
            q[i].put(num)
        else:
            groups_in[idx] = start + l
            q.append(Queue())
            q[-1].put(num)
            l += 1
```

代码运行截图

27932: Less or Equal

思路：直觉告诉我首尾可能有特殊情况，分开讨论即可

代码

```
n, k = map(int, input().split())
ls = sorted(list(map(int, input().split())))
if k == n:
    print(ls[-1])
elif k == 0:
    print(1 if ls[0] != 1 else -1)
else:
    print(ls[k - 1] if ls[k - 1] != ls[k] else -1)
```

代码运行截图

27948: FBI树

http://cs101.openjudge.cn/practice/27948/

思路：自定义类+递归

代码

```
def s_type(s):
    if '1' not in s:
        return 'B'
    elif '0' not in s:
        return 'I'
    else:
        return 'F'
```

```python
class Tree:
    def __init__(self):
        self.t = ''
        self.left = self.right = None

    def build_tree(self, s):
        self.t = s_type(s)

        if len(s) == 1:
            return
        else:
            mid = len(s) // 2
            self.left = Tree()
            self.right = Tree()
            self.left.build_tree(s[:mid])
            self.right.build_tree(s[mid:])

    def __str__(self):
        if self.left:
            return str(self.left) + str(self.right) + self.t
        else:
            return self.t


input()
s = input()
tree = Tree()
tree.build_tree(s)
print(tree)
```

代码运行截图

27925: 小组队列

思路：看了提交同学的内存占用，很小，干脆不弹出空列表了，记录队首位置即可

代码

```python
from queue import Queue

t = int(input())
groups = {}
search = {}
for i in range(t):
    ls = list(map(int, input().split()))
    groups[i] = ls
    for j in ls:
        search[j] = i
q = []
start = 0
l = 0
groups_in = {i: -1 for i in range(t)}

while True:
    s = input().split()
    if s[0][0] == 'S':
        break
    elif s[0][0] == 'D':
        print(q[start].get())
        if q[start].empty() == 1:
            start += 1
            l -= 1
    else:
        num = int(s[1])
        idx = search[num]
        i = groups_in[idx]
        if i - start >= 0:
            q[i].put(num)
        else:
            groups_in[idx] = start + l
            q.append(Queue())
            q[-1].put(num)
            l += 1
```

代码运行截图

27928: 遍历树

http://cs101.openjudge.cn/practice/27928/

思路：建树麻烦，直接递归了

代码

```python
dic = {}
n = int(input())
for _ in range(n):
    ls = list(map(int, input().split()))
    dic[ls[0]] = ls[1:]
roots = {i: True for i in dic}
for i in dic:
    for j in dic[i]:
        roots[j] = False
for i in roots:
    if roots[i]:
        root = i
        break


def iterate(i):
    ls = sorted([i] + dic[i])
    for j in ls:
        if i == j:
            print(i)
        else:
            iterate(j)
```
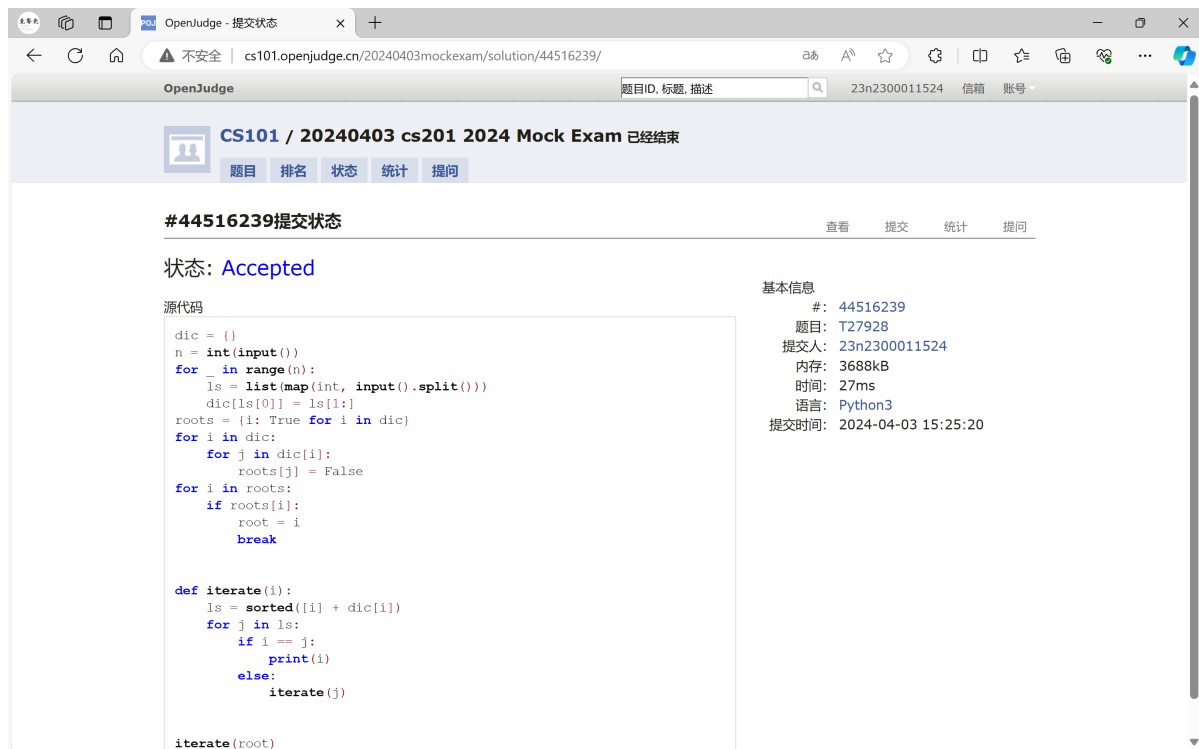
```
iterate(root)
```

代码运行截图

2. 学习总结和收获

月考题目蛮简单的，45min一遍过，不写诗了，补一补每日选做吧。