Assignment #1: 拉齐大家Python水平

2024 spring, Complied by 23工院 武昱达

编程环境

操作系统：Windows 11

Python编程环境：PyCharm 2023.1.4 (Professional Edition)

1. 题目

20742: 泰波拿契数

http://cs101.openjudge.cn/practice/20742/

思路：

带@lru_cache的动态规划

代码

```
# 23工院 武昱达
from functools import lru_cache
@lru_cache(maxsize=None)
def T(n):
    if n==0:
        return 0
    if n==1:
        return 1
    if n==2:
        return 1
    return T(n-3)+T(n-2)+T(n-1)

print(T(int(input())))
```

代码运行截图 <mark>(至少包含有"Accepted")</mark>

状态: Accepted

源代码

```
from functools import lru_cache
@lru_cache(maxsize=None)
def T(n):
    if n==0:
        return 0
    if n==1:
        return 1
    if n==2:
        return 1
    return T(n-3)+T(n-2)+T(n-1)

print(T(int(input())))
```

58A. Chat room

greedy/strings, 1000, http://codeforces.com/problemset/problem/58/A

思路:

见注释

代码

```python
# 23工院 武昱达
list_s = list(input())
list_result = []
list_hello=list("hello")
judge = 1
for index,item in enumerate(list_hello): #对每一个字母进行遍历
    try: #防止索引超出范围
        while item != list_s[index]:  #当第index个索引不是对应字母时,将字母删除
            try:
                list_s.remove(list_s[index])
            except IndexError: #删到出现错误,说明输入不合要求
                judge=0
                break
    except IndexError:#索引出现错误,说明输入不合要求
        judge=0

if len(list_s) <5:
    judge = 0
else:
    for i in range(5):
        list_result.append(list_s[i])

if "".join(list_result)=="hello":
    judge = 1

if judge == 0:
    print("NO")
elif judge==1:
    print("YES")
```

代码运行截图 <mark>(至少包含有"Accepted")</mark>

→ Source

```python
list_s = list(input())
list_result = []
list_hello=list("hello")
judge = 1
for index,item in enumerate(list_hello): #对每一个字母进行遍历
    try: #防止索引超出范围
        while item != list_s[index]:  #当第index个索引不是对应字母时，将字母删除
            try:
                list_s.remove(list_s[index])
            except IndexError: #删到出现错误，说明输入不合要求
                judge=0
                break
    except IndexError:#索引出现错误，说明输入不合要求
        judge=0

if len(list_s) <5:
    judge = 0
else:
    for i in range(5):
        list_result.append(list_s[i])

if "".join(list_result)=="hello":
    judge = 1

if judge == 0:
    print("NO")
elif judge==1:
    print("YES")
```

118A. String Task

implementation/strings, 1000, http://codeforces.com/problemset/problem/118/A

思路:

代码

```python
# 23工院  武昱达
dict_vowel = ['A','O','Y','E','U','I',
              'a','o','y','e','u','i']
word=input()
list_word=list(word)
list_result=[]
for index,item in enumerate(list_word):
    if item not in dict_vowel:
        list_result.append(item.lower())
for index,item in enumerate(list_result):
    list_result[index] = "."+item
print("".join(list_result))
```

代码运行截图 (AC代码截图，至少包含有"Accepted")

→ Source

```python
dict_vowel = ['A','O','Y','E','U','I',
              'a','o','y','e','u','i']
word=input()
list_word=list(word)
list_result=[]
for index,item in enumerate(list_word):
    if item not in dict_vowel:
        list_result.append(item.lower())
for index,item in enumerate(list_result):
    list_result[index] = "."+item
print("".join(list_result))
```

Click to see test details

22359: Goldbach Conjecture

http://cs101.openjudge.cn/practice/22359/

思路:

欧拉筛

代码

```python
# 23工院 武昱达
def Euler_sieve(n):
    primes = [False]+[True for _ in range(n)]
    p = 2
    while p*p <= n:
        if primes[p]:
            for i in range(p*p, n+1, p):
                primes[i] = False
        p += 1
    return primes

n=int(input())
l=Euler_sieve(10000)
for i in range(n//2):
    if l[i] and l[n-i]:
        print(i,n-i)
        break
```

代码运行截图　<mark>(AC代码截图，至少包含有"Accepted")</mark>

源代码

```
# 23工院 武昱达
def Euler_sieve(n):
    primes = [False]+[True for _ in range(n)]
    p = 2
    while p*p <= n:
        if primes[p]:
            for i in range(p*p, n+1, p):
                primes[i] = False
        p += 1
    return primes

n=int(input())
l=Euler_sieve(10000)
for i in range(n//2):
    if l[i] and l[n-i]:
        print(i,n-i)
        break
```

23563: 多项式时间复杂度

思路:

代码

```
1  raw=list(map(str,input().split("+")))
2  res=0
3  for i in raw:
4      a,b=map(str,i.split("^"))
5      if a[0]!="0":
6          res=max(res,int(b))
7  print("n^"+str(res))
```

代码运行截图 <mark>(AC代码截图，至少包含有"Accepted")</mark>

#43688570提交状态

状态: Accepted

源代码

```
raw=list(map(str,input().split("+")))
res=0
for i in raw:
    a,b=map(str,i.split("^"))
    if a[0]!="0":
        res=max(res,int(b))
print("n^"+str(res))
```

24684: 直播计票

思路:

代码

```python
# 23工院 武昱达
from collections import defaultdict
raw=list(map(int,input().split()))
votes=defaultdict(int)
for i in raw:
    votes[i]+=1

temp=[(i,j) for i,j in votes.items()]
temp.sort(key=lambda x:x[1],reverse=True)

out=[]
for i in temp:
    if i[1]==max(votes.values()):
        out.append(i[0])
    else:
        break
out.sort()
print(*out)
```

代码运行截图 <mark>(AC代码截图，至少包含有"Accepted")</mark>

状态: Accepted

源代码

```python
from collections import defaultdict
raw=list(map(int,input().split()))
votes=defaultdict(int)
for i in raw:
    votes[i]+=1

temp=[(i,j) for i,j in votes.items()]
temp.sort(key=lambda x:x[1],reverse=True)

out=[]
for i in temp:
    if i[1]==max(votes.values()):
        out.append(i[0])
    else:
        break
out.sort()
print(*out)
```

2. 学习总结和收获

<mark>如果作业题目简单，有否额外练习题目，比如：OJ"数算pre每日选做"、CF、LeetCode、洛谷等网站题目。</mark>

题目比较简单，适合作为恢复训练。