

# Assignment #1: 拉齐大家Python水平

2024 spring, Compiled 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: 泰波拿契數

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

思路:

带@lru\_cache的动态规划

## 代码

```
1 # 23工院 武昱达
2 from functools import lru_cache
3 @lru_cache(maxsize=None)
4 def T(n):
5     if n==0:
6         return 0
7     if n==1:
8         return 1
9     if n==2:
10        return 1
11    return T(n-3)+T(n-2)+T(n-1)
12
13 print(T(int(input())))
```

代码运行截图 (至少包含有"Accepted")

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

```
1  # 23工院 武昱达
2  list_s = list(input())
3  list_result = []
4  list_hello=list("hello")
5  judge = 1
6  for index,item in enumerate(list_hello): #对每一个字母进行遍历
7      try: #防止索引超出范围
8          while item != list_s[index]: #当第index个索引不是对应字母时，将字母删除
9              try:
10                 list_s.remove(list_s[index])
11             except IndexError: #删到出现错误，说明输入不合要求
12                 judge=0
13                 break
14         except IndexError:#索引出现错误，说明输入不合要求
15             judge=0
16
17  if len(list_s) <5:
18      judge = 0
19  else:
20      for i in range(5):
21          list_result.append(list_s[i])
22
23  if "".join(list_result)=="hello":
24      judge = 1
25
26  if judge == 0:
27      print("NO")
28  elif judge==1:
29      print("YES")
```

代码运行截图 (至少包含有"Accepted")

#	Author	Problem	Lang	Verdict	Time	Memory
224138793	Practice: wuyuda	<a href="#">58A</a> - 10	Python 3	Accepted	78 ms	0 KB

→ Source

```
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

```
1 # 23工院 武昱达
2 dict_vowel = ['A','O','Y','E','U','I',
3               'a','o','y','e','u','i']
4 word=input()
5 list_word=list(word)
6 list_result=[]
7 for index,item in enumerate(list_word):
8     if item not in dict_vowel:
9         list_result.append(item.lower())
10 for index,item in enumerate(list_result):
11     list_result[index] = "."+item
12 print("".join(list_result))
```

代码运行截图 (AC代码截图，至少包含有"Accepted")

General						
#	Author	Problem	Lang	Verdict	Time	Memory
224688746	Practice: wuyuda	<a href="#">118A</a> - 13	Python 3	Accepted	92 ms	0 KB

→ **Source**

```
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

```
1  # 23工院 武昱达
2  def Euler_sieve(n):
3      primes = [False]+[True for _ in range(n)]
4      p = 2
5      while p*p <= n:
6          if primes[p]:
7              for i in range(p*p, n+1, p):
8                  primes[i] = False
9          p += 1
10     return primes
11
12 n=int(input())
13 l=Euler_sieve(10000)
14 for i in range(n//2):
15     if l[i] and l[n-i]:
16         print(i,n-i)
17         break
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

状态: Accepted

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

<http://cs101.openjudge.cn/practice/23563/>

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 (AC代码截图, 至少包含有"Accepted")

## #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

<http://cs101.openjudge.cn/practice/24684/>

思路:

代码

```
1  # 23工院 武昱达
2  from collections import defaultdict
3  raw=list(map(int,input().split()))
4  votes=defaultdict(int)
5  for i in raw:
6      votes[i]+=1
7
8  temp=[(i,j) for i,j in votes.items()]
9  temp.sort(key=lambda x:x[1],reverse=True)
10
11 out=[]
12 for i in temp:
13     if i[1]==max(votes.values()):
14         out.append(i[0])
15     else:
16         break
17 out.sort()
18 print(*out)
```

代码运行截图 (AC代码截图, 至少包含有"Accepted")

状态: Accepted

源代码

```
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

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。

题目比较简单，适合作为恢复训练。