

# Assignment #1: 拉齐大家Python水平

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2023 fall, Compiled by Xinjie Song, Phy

## 说明:

- 1) 数算课程的先修课是计概，由于计概学习中可能使用了不同的编程语言，而数算课程要求Python语言，因此第一周作业练习Python编程。如果有同学坚持使用C/C++，也可以，但是建议也要会Python语言。
  - 2) 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。
  - 3) 课程网站是Canvas平台, <https://pku.instructure.com>, 学校通知3月1日导入选课名单后启用。**作业写好后，保留在自己手中，待3月1日提交。**
- 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。
- 4) 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

### 20742: 泰波拿契數

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

思路: 善用Python负数索引

## 代码

```
ls = [0, 1, 1]
for i in range(30):
    ls.append(ls[-1] + ls[-2] + ls[-3])
print(ls[int(input())])
```

代码运行截图



58A. Chat room

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

思路：常规思路

代码

```
str_input = input()
str_wanted = 'hello'

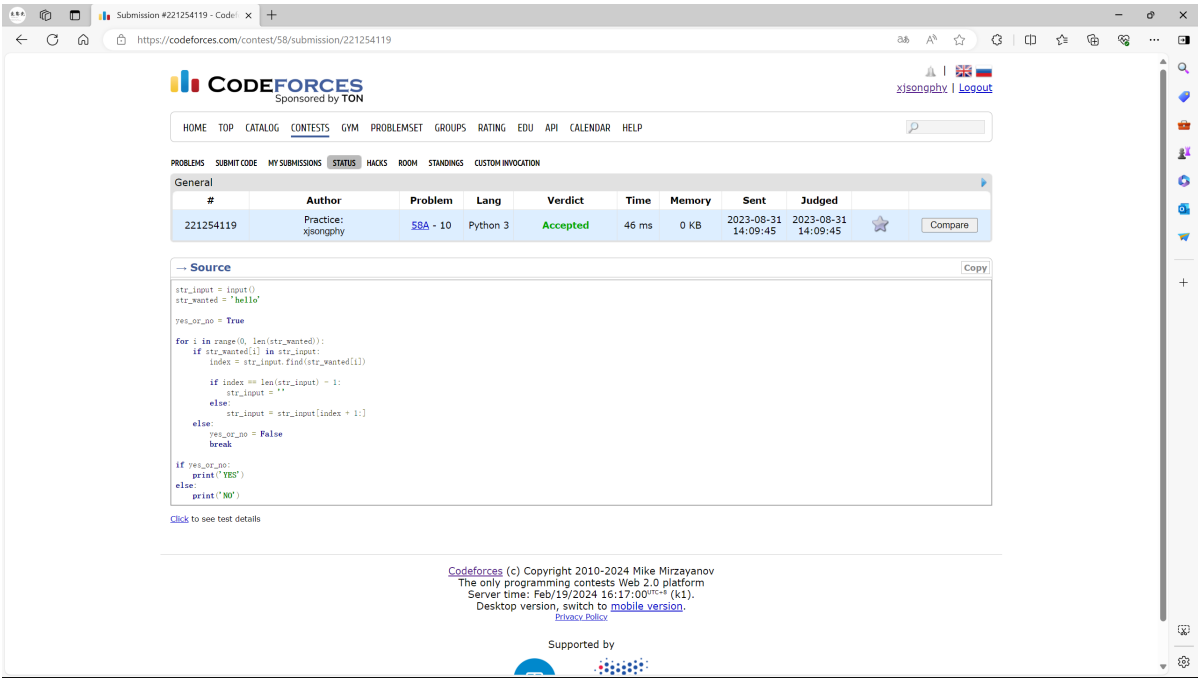
yes_or_no = True

for i in range(0, len(str_wanted)):
    if str_wanted[i] in str_input:
        index = str_input.find(str_wanted[i])

        if index == len(str_input) - 1:
            str_input = ''
        else:
            str_input = str_input[index + 1:]
    else:
        yes_or_no = False
        break

if yes_or_no:
    print('YES')
else:
    print('NO')
```

代码运行截图



118A. String Task

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

思路：常规思路

代码

```
output_list = []
input_list = list(input().lower())
string_for_search = 'aoyeui'

for char in input_list:
    if char in string_for_search:
        continue
    else:
        output_list.append('.')
        output_list.append(char)

print(''.join(output_list))
```

代码运行截图

Submission #222076902 - Codeforces

https://codeforces.com/contest/118/submission/222076902

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General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
222076902	Practice: xjsongqhy	118A - 13	Python 3	Accepted	92 ms	0 KB	2023-09-06 16:16:28	2023-09-06 16:16:29	☆	Compare

-- Source

```
output_list = []
input_list = list(input().lower())
string_for_search = 'ayyeu!'

for char in input_list:
    if char in string_for_search:
        continue
    else:
        output_list.append(',')
        output_list.append(char)

print(''.join(output_list))
```

[Click to see test details](#)

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The only programming contests Web 2.0 platform  
Server time: Feb/19/2024 16:17:37<sup>UTC+8</sup> (h2).  
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## 22359: Goldbach Conjecture

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

思路：直接从cheatsheet上抄欧拉筛

### 代码

```
n = int(input())
nums = {i: True for i in range(2, n)}
primes = []

for i in range(2, n):
    if nums[i]:
        primes.append(i)
        for j in primes:
            if i*j >= n:
                break
            nums[i*j] = 0
            if i % j == 0:
                break

dic = {i: True for i in primes}
for prime in primes:
    if n - prime in dic:
        print(prime, n - prime)
        break
```

代码运行截图



## 23563: 多项式时间复杂度

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

思路：善用正则表达式

### 代码

```
from re import match

ls = [i.split('^') for i in input().split('+')]
max_num = 0
for i in ls:
    if match(rf'[0-9]+', i[-1]):
        if i[0][0] != '0' and int(i[-1]) > max_num:
            max_num = int(i[-1])
print(f'n^{max_num}')
```

代码运行截图



## 24684: 直播计票

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

思路：字典快速查找计数，转成元组的列表排序

### 代码

```
ls = list(map(int, input().split()))
dic = {i: 0 for i in set(ls)}
for i in ls:
    dic[i] += 1

ls = sorted([(-v, k) for k, v in dic.items()])
c = ls[0][0]
print(ls[0][1], end='')
for i in ls[1:]:
    if i[0] > c:
        break
    print(f' {i[1]}', end='')
```

代码运行截图



## 2. 学习总结和收获

题目过于简单；至于额外题目，刚开学，先不练了。