

Assignment #2: 语法练习

Updated 0126 GMT+8 Sep 24, 2024

2024 fall, Compiled by ==同学的姓名、院系==

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。

3) 课程网站是Canvas平台, <https://pku.instructure.com>, 学校通知9月19日导入选课名单后启用。**作业写好后，保留在自己手中，待9月20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。

1. 题目

263A. Beautiful Matrix

<https://codeforces.com/problemset/problem/263/A>

思路：将矩阵看作若干列表

计算出1的所在行和所在列即可，需要注意的时index的使用前提是这个数必须在列表中，否则会报错

代码

```
line1 = list(map(int, input().split()))
line2 = list(map(int, input().split()))
line3 = list(map(int, input().split()))
line4 = list(map(int, input().split()))
line5 = list(map(int, input().split()))
x = 0
y = 0
if 1 in line1:
    y=1
    for i in line1:
        if i==1:
            x+=1
            break
    else:
        x+=1
elif 1 in line2:
    y=2
    for i in line2:
        if i==1:
```

```
        x+=1
        break
    else:
        x+=1
elif 1 in line3:
    y=3
    for i in line3:
        if i==1:
            x+=1
            break
        else:
            x+=1
elif 1 in line4:
    y=4
    for i in line4:
        if i==1:
            x+=1
            break
        else:
            x+=1
elif 1 in line5:
    y=5
    for i in line5:
        if i==1:
            x+=1
            break
        else:
            x+=1
step = abs(x-3) + abs(y-3)
print(step)
```

代码运行截图 == (至少包含有"Accepted") ==

General									
#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged	
280726238	Practice: chaain	263A - 8	Python 3	Accepted	154 ms	16 KB	2024-09-11 15:05:59	2024-09-11 15:05:59	<div>★</div> <div>Compare</div>

→ Source

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```

line1 = list(map(int, input().split()))
line2 = list(map(int, input().split()))
line3 = list(map(int, input().split()))
line4 = list(map(int, input().split()))
line5 = list(map(int, input().split()))
x = 0
y = 0
if 1 in line1:
    y=1
    for i in line1:
        if i==1:
            x+=1
        break
    else:
        x+=1
elif 1 in line2:
    y=2
    for i in line2:
        if i==1:
            x+=1
        break
    else:
        x+=1
elif 1 in line3:
    y=3
    for i in line3:
        if i==1:
            x+=1
        break
    else:
        x+=1
elif 1 in line4:
    y=4
    for i in line4:
        if i==1:
            x+=1
        break
    else:
        x+=1
elif 1 in line5:
    y=5
    for i in line5:
        if i==1:
            x+=1
        break
    else:
        x+=1
step = abs(x-3) + abs(y-3)
print(step)

```

1328A. Divisibility Problem

<https://codeforces.com/problemset/problem/1328/A>

思路：根据数学规律直接算出离a最近的b的倍数

代码

```

n = int(input())
jieguo = []
s=0
for i in range(n):
    a, b = map(int, input().split())
    if a%b != 0:
        s=(a//b+1)*b-a
        jieguo.append(s)
        s=0
for i in jieguo:
    print(i)

```

代码运行截图 == (至少包含有"Accepted") ==

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
280752996	Practice: chaain	1328A - 12	Python 3	Accepted	93 ms	20 KB	2024-09-11 18:23:17	2024-09-11 18:23:17	☆	Compare

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```
n = int(input())
jiegou = []
s=0
for i in range(n):
    a, b = map(int, input().split())
    if a%b != 0:
        s=(a//b+1)*b-a
        jiegou.append(s)
    s=0
for i in jiegou:
    print(i)
```

427A. Police Recruits

<https://codeforces.com/problemset/problem/427/A>

思路：

研究警察数的动态变化即可

代码

```
sum =0
jingcha = 0
n = int(input())
list = list(map(int, input().split()))
for j in list:
    if j >= 0:
        jingcha += j
    if j == -1:
        if jingcha > 0:
            jingcha -= 1
        else:
            sum += 1
print(sum)
```

代码运行截图 == （AC代码截图，至少包含有"Accepted"） ==

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged		
280763914	Practice: chaain	427A - 21	Python 3	Accepted	93 ms	8932 KB	2024-09-11 19:53:28	2024-09-11 19:53:28	☆	Compare

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```
sum =0
jingcha = 0
n = int(input())
list = list(map(int, input().split()))
for j in list:
    if j >= 0:
        jingcha += j
    if j == -1:
        if jingcha > 0:
            jingcha -= 1
        else:
            sum += 1
print(sum)
```

[Click](#) to see test details

02808: 校门外的树

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

思路：将区间看作集合，利用集合的性质求解

代码

```
L,M = map(int,input().split())
ans = 0
set1=set(range(0,L+1))
set2=set()
for i in range(M):
    a,b = map(int,input().split())
    set2=set(range(a,b+1))
    set1 =(set1.difference(set2))
    set2 = set()
ans = len(set1)
print(ans)
```

代码运行截图 == (AC代码截图，至少包含有"Accepted") ==

#46111496提交状态

[查看](#) [提交](#) [统计](#) [提问](#)

状态: Accepted

源代码

```
L,M = map(int,input().split())
ans = 0
set1=set(range(0,L+1))
set2=set()
for i in range(M):
    a,b = map(int,input().split())
    set2=set(range(a,b+1))
    set1 =(set1.difference(set2))
    set2 = set()
ans = len(set1)
print(ans)
```

基本信息

#: 46111496
题目: 02808
提交人: chaain
内存: 5440kB
时间: 33ms
语言: Python3
提交时间: 2024-09-18 19:10:39

sy60: 水仙花数II

<https://sunnywhy.com/sfbj/3/1/60>

思路：算出个位十位百位即可

注意输出要求

代码

```
def shuixianhuashu(num):
    ge = num % 10
    shi = (num // 10) % 10
    bai = num // 100
    if ge**3 + shi**3 + bai**3 == num:
        return 1
    else:
        return 0
list1=list(range(100,1000))
a,b =map(int,input().split())
list2=list1[list1.index(a):list1.index(b)+1]
list3=[]
for i in list2:
    if shuixianhuashu(i) == 1:
        list3.append(i)
if len(list3)==0:
    print('NO')
else:
    for i in range(len(list3)-1):
        print(list3[i],end=' ')
    print(list3[-1])
```

代码运行截图 == (AC代码截图, 至少包含有"Accepted") ==

完美通过

100% 数据通过测试

运行时长: 0 ms

语言: Python

```
1 def shuixianhuashu(num):
2     ge = num % 10
3     shi = (num // 10) % 10
4     bai = num // 100
5     if ge**3 + shi**3 + bai**3 == num:
6         return 1
7     else:
8         return 0
9 list1=list(range(100,1000))
10 a,b =map(int,input().split())
11 list2=list1[list1.index(a):list1.index(b)+1]
12 list3=[]
13 for i in list2:
14     if shuixianhuashu(i) == 1:
15         list3.append(i)
16 if len(list3)==0:
17     print('NO')
18 else:
19     for i in range(len(list3)-1):
20         print(list3[i],end=' ')
21     print(list3[-1])
```

01922: Ride to School

<http://cs101.openjudge.cn/practice/01922/>

思路：直接计算不提前出发的人中最快到达的人所用时间即可，注意因为有float，尽量减少除法的使用

代码

```
import math
list1 = []
while True:
    n = int(input())
```

```

if n!=0:
    time = []
    for i in range(n):
        a, b = map(float, input().split())
        if b >= 0:
            time.append(4.5*3600/a+b)
        list1.append(math.ceil(min(time)))
    else:
        break
for i in list1:
    print(i)

```

代码运行截图 == (AC代码截图, 至少包含有"Accepted") ==

状态: Accepted

源代码

```

import math
list1 = []
while True:
    n = int(input())
    if n!=0:
        time = []
        for i in range(n):
            a, b = map(float, input().split())
            if b >= 0:
                time.append(4.5*3600/a+b)
            list1.append(math.ceil(min(time)))
        else:
            break
    for i in list1:
        print(i)

```

基本信息

#: 46264139
 题目: 01922
 提交人: chaain
 内存: 3844kB
 时间: 42ms
 语言: Python3
 提交时间: 2024-09-28 23:26:30

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“计概2024fall每日选做”、CF、LeetCode、洛谷等网站题目。==

这周的题感觉难度上来了, 感觉不仅需要掌握语法, 数学的运算思维往往也很重要。数学运算上的优化可以让自己的

代码更加优美简洁, 同时也省去了很多复杂的循环和判断。

每日两题还在跟着做, 不过明显感觉到了题目的难度正在上升。感觉每道题都能学到点新东西吧: 也许是语法, 也可

能是一些更好的思维模式。

希望下周能够再接再厉!!!