



程序设计实践（一）

哈尔滨工业大学 计算机学院
任课教师：孙大烈教授
助教：付万增



考核方式

1. 课堂（出勤+问答+练习+做题）

权重50%，每次5分，计50分。

2. 作业（课后作业+HOJ刷题+校赛）

权重50%，其中课后作业+HOJ刷题占40%，校赛占10%。

在HOJ上每刷过1个题，计1分；校赛每做出1个题，计2分。

注意：以个人学号为用户名进行注册，注册方式见群文件。

3. 加分

除了前两项规定的内容之外，在HOJ上刷过60个题加5分，过80个题加10分，过100个题加20分；校赛做出3个题3分，做出4个题加5分，做出5个题加10分。

4.ACM集训队

表现优异者可以加入ACM集训队，参加暑期集训。

课程内容



第一讲	基础
第二讲	排序
第三讲	贪心
第四讲	二分
第五讲	分治
第六讲	动态规划（改习题课）
第七讲	栈与队列
第八讲	搜索基础
第九讲	图论基础
第十讲	字符串处理

第十一讲

校赛真题选讲



<http://acm.hit.edu.cn/hojx/showcontest/25/>

A. Calendar

B. Poker Cards

C. Transport Network

D. Diff

E. Duang~

F. Game



A. Calendar

Description

znl1087 lost his calendar, so can you help him to calculate the Date?

Input

There are multiple test cases.

Each test case contains four numbers in one line.

year($1949 \leq \text{year} \leq 9999$), month($1 \leq \text{month} \leq 12$), day($1 \leq \text{day} \leq 31$), n($0 \leq n \leq 10000$)

The input end with year=0, month=0, day=0, n=0.

It's granted that the input date is legal.

Output

Output the date which n days after the input date.

Format: yyyy-mm-dd(1949-01-01)

Sample Input

```
2015 04 20 5
2015 02 28 10
0 0 0 0
```

Sample Output

```
2015-04-25
2015-03-10
```

A. Calendar



Description

给定一个日期和一个数字 n ，求 n 天以后的日期

类别：模拟

考点：基础代码能力

提示：日历题目是特殊的进制转换题目

闰年：四年一闰，百年不闰，四百年再闰。

Sample Input

```
2015 04 20 5
```

```
2015 02 28 10
```

```
0 0 0 0
```

Sample Output

```
2015-04-25
```

```
2015-03-10
```

B. Poker Cards



Description

znl1087 likes to play poker. One day, he invented a unique poker, which has n kinds of cards with a_i cards in the i th kind of card.

Now znl1087 will take m cards from the deck. He wants to know the numbers of the different case of the m cards?

Notice that we think the cards in one kind are same cards.

Input

There are multiple test cases.

Each test case contains several lines.

The first line contains two integers N ($1 \leq N \leq 100$) and M ($1 \leq M \leq 100$).

The second line contains n integers, which a_i ($0 \leq a_i \leq 100$) means the numbers of i th kind card.

The input end with $N=0, M=0$.

Output

For each test case in the input, you should output a line indicating the numbers of the different case. The answer maybe very large, so output the answer modulo 100007.

B. Poker Cards



Description

给定 n 种扑克牌，每种 a_i 张，取 m 张，问有多少种取法？

提示：排列组合 or 动态规划

Sample Input

```
2 8
4 4
2 5
4 4
3 8
5 5 5
0 0
```

Sample Output

```
1
4
27
```




Description

addf is the owner of a burger restaurant. addf has many restaurants in this city. Although addf has only one type of burger, it's very popular in this city and people like it.

Now addf has just developed the delivery service. The city addf lives in can be considered as a matrix of $n * m$ ($1 \leq n, m \leq 1000$), addf has r ($1 \leq r \leq n * m$) restaurants in the city located on the matrix, there are c ($1 \leq c \leq n * m$) customers who just ordered b_i ($1 \leq b_i \leq 1000$) burgers. For addf has only one type of burger, addf can send the delivery from any of addf's restaurant to any of addf's customer. It will cost \$1 when a burger passing 1 unit length of the matrix. As a intelligent guy, addf wants to minimize the cost.

As we know, the city is now on construction, so there will be h ($1 \leq h \leq n * m$) points on the matrix which are not able to get.

第十一讲

C. Transport Network



Description

图论? 搜索? 最短路?

pass



Description

Given N numbers $A[1] \dots A[n]$, you should modify the least number of elements, which makes that for every $A[i]$ ($1 < i \leq n$), $A[i] = A[i-1] + 1$.

Input

There are several tests. First is positive integer N ($1 \leq N \leq 10^5$). Next N integer $A[i]$ ($A[i] \leq 10^6$). The input is finished by a line containing 0

Output

Output the least number of elements you changed.

Sample Input

4 4 0 3 7 0

Sample Output

2

Hint

In this example, change $A[2] = 0$ to $A[2] = 5$, change $A[3] = 3$ to $A[3] = 6$, the final sequence is 4 5 6 7.



Description

给定n个数字，要求最少的修改次数，使得n个数字变成等差为1的等差数列。

类别：开动脑筋的题目

Input

There are several tests. First is positive integer N ($1 \leq N \leq 10^5$). Next N integer $A[i]$ ($A[i] \leq 10^6$).

The input is finished by a line containing 0

Output

Output the least number of elements you changed.

Sample Input

```
4 4 0 3 7
0
```

Sample Output

```
2
```

Hint

In this example, change $A[2] = 0$ to $A[2] = 5$, change $A[3] = 3$ to $A[3] = 6$, the final sequence is 4 5 6 7.

第十一讲

E. Duang~



Description

Bus Xiao and Smile Dog watch bilibili everyday. One day they find a video which title is Cheng Long's shampoo. after they watch the video, Smile Dog give many text and ask Bus Xiao to change the text into the way he want by following rule:

1. If you find "chenglong" in his text ,you should change it to "wojiateji", example : chenglong \rightarrow wojiateji
2. If you find "toufa" in his text ,you should change it to "duang", example : toufa \rightarrow duang
3. The new word should follow original word's case. example : the original word is "ChEnglOnG ", the new word is "WoJiatEjI".

Input

There are multiple test case, input will end with a single number -1.

The first line contain an integer N ($1 \leq N \leq 10^6$), representing the text's length. following line is the text. The text will only contain letter "a-z, A-Z".

Output

Printf the Case and the new text transform by the rule.



Description

给定一个字符串，将其中‘chenglong’替换为‘wojiateji’，‘toufa’替为‘duang’。注意“ChEnglOnG”替换为“WoJiatEjl”，即识别时不区分大小写，替换时保留原来大小写。

类别：字符串处理题，特定词汇替换。

Sample Input

```
16 ChEngLongdetouFa
28 ShitoUfaDetejishitejidetOufA
-1
```

Sample Output

```
Case #1 : WoJiaTejideduaNg
Case #2 : ShiduAngDetejishitejidedUanG
```



Description

Recently, bhb is playing a game. The game's rule is very simple.

Give you a number x with n digits ($A_n, A_{n-1}, A_{n-2}, \dots, A_2, A_1$). If x is a palindromic number, the game is over, otherwise plus x with x 's reverse number (consists of $A_1, A_2, \dots, A_{n-1}, A_n$) until it becomes a palindromic number.

For example, the number is 19. In the first step, the number will become $19 + 91 = 110$, then, the number will become $110 + 011 = 121$, 121 is a palindromic number. So the final number is 121.

Now, bhb wants to know the result of the game, but some numbers are special that can't become a palindromic number through calculation within 50 steps.

Input

The first line has a number T ($T \leq 100000$), indicating the number of test cases. Then next T lines, each line has only one number denote the number x .

Output

For each case, you should output "Case #t" at first, t denote the index of the test. If the number x can become a palindromic number in 50 step, you can output the final number. If can't output the "Bad number".



Description

给定一个数字，如果这个数字是回文数字，结束。否则，将这个数字加上本身翻转以后的数字，如果是回文数字，结束；否则，继续这个过程，直到找到回文数字，或者循环次数超过50。

分类：高精度加法

Sample Input

2

19

196

Sample Output

Case #1: 121

Case #2: Bad number



高精度加法

问题描述：大数加法。

Int的存储范围： $-2147483648 \sim 2147483647$

int64更大： $-2^{63} \sim 2^{63}+1$

但是固定数据类型的存储空间毕竟有限，如果是一百位的数字相加怎么办？

数字即字符串。

想一想小学如何做加法？**列竖式**。

高精度加法：利用字符串的一系列操作模拟竖式的加法。

$$\begin{array}{r} 212 \\ + 32 \\ \hline = 244 \end{array}$$



- 一分耕耘，一分收获！
- 希望在今后的学习生活中共同进步！

谢谢！