

Problem A. Vowels and consonants

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

Albert does not agree with the basic English alphabet. He thinks, that in the alphabet, first, we need to print vowel letters first and then consonants, and both vowels and consonants are ordered alphabetically. So he asks us to sort string according to his own alphabet.

Input

The first line contains the number n ($1 \leq n \leq 10^5$), denoting the length of string. The second line contains the string s .

Output

Print the answer.

Examples

standard input	standard output
5 abcde	aebcd
5 wlree	eelrw

Note

Vowel letters are a, e, i, o and u.

Problem B. House of love

Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **256 megabytes**

Once upon a time, in one university, created a one organization called "House of love" in which friendship is the main value. So they created one test to know level of their friendship. Two person write some numbers and gives it to you, to check common numbers.

Input

First line contain two numbers n,m. Size of arrays. Next 2 line contain n numbers of first person and m numbers of second.

Output

Print common numbers.

Examples

standard input	standard output
4 2 1 2 2 1 2 2	2 2
3 5 4 9 5 4 3 2 1 9	4 9
0 1 1	
4 2 1 2 3 1 2 2	2

Problem C. Points in Proximity

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

You are given a list of integer points in a line. Find the pair of points with the least absolute difference. If there are more than one pairs output them all.

Input

The first line contains an integer $N(2 \leq N \leq 2 \times 10^5)$, number of points. The next line represents N integer numbers $(-10^7 \leq points[i] \leq 10^7)$ denoting the points in a line.

Output

Output the pairs of points with the least absolute difference.

Examples

standard input	standard output
6 -20 -3916237 -357920 -362060 30 6246457	-20 30
5 1 5 4 3 2	1 2 2 3 3 4 4 5

Problem D. Calendar

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

You're given n dates in format $DD - MM - YYYY$. Sort them in ascending and print in the same format.

Input

The first line contains one integer n ($1 \leq n \leq 10^3$). Next n lines contain dates in format $DD - MM - YYYY$ ($1 \leq D \leq 31, 1 \leq M \leq 12, 1900 \leq Y \leq 3000$).

Output

Print sorted dates in the same format as the input.

Examples

standard input	standard output
3 01-12-2000 01-11-2000 31-10-2000	31-10-2000 01-11-2000 01-12-2000
4 01-12-1999 12-11-2002 20-02-1900 31-01-1999	20-02-1900 31-01-1999 01-12-1999 12-11-2002

Problem E. Incomplete sorting

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

You are given matrix with n rows and m columns.

You have to sort each column of matrix in descending order.

Input

The first line consists of two integers n and m - number of rows and columns of matrix respectively.

Each of the next n lines contains m integers $d_{i,j}$ - elements of the matrix at the intersection of i_{th} row and j_{th} column.

Output

Print this matrix after sorting.

Example

standard input	standard output
4 3	9 8 8
1 2 3	6 7 7
4 5 6	4 5 6
6 7 8	1 2 3
9 8 7	

Problem F. New GPA

Input file: standard input
Output file: standard output
Time limit: 3 seconds
Memory limit: 256 megabytes

KBTU introduces new GPA calculation system. You're given n students, their marks and number of credits for their subjects. Sort them by total GPA. It is calculated as $\frac{\sum_{i=1}^m g_i * c_i}{\sum_{i=1}^m c_i}$, where m - student's number of subjects, g_i, c_i - GPA and number of credits for i -th subject respectively. GPA scale is given in the notes.

Input

First line contains one integer n ($1 \leq n \leq 10^5$). Each of the next n lines contains information about the i -th student: his lastname, firstname, an integer m_i ($1 \leq m_i \leq 10$) - number of subjects for this student, then m_i marks and number of credits for each subject.

Output

You should print sorted list of students. Each student should be printed in the following format: *lastname firstname GPA*. First, sort them by overall GPA, if it's equal, sort by lastname, then by firstname. GPA should be printed with three digits after decimal point.

Example

standard input	standard output
5	Stepanenko Ivan 3.056
Issenbayev Yernur 4 A 4 D+ 2 B 3 A+ 4	Issenbayev Yernur 3.308
Yermekbayeva Diana 3 A+ 4 B+ 3 B 1	Yermekbayeva Diana 3.688
Kadyrov Asman 2 A+ 4 A+ 4	Bissimbayev Arystan 3.700
Stepanenko Ivan 3 C+ 3 F 1 A+ 5	Kadyrov Asman 4.000
Bissimbayev Arystan 3 A+ 4 A+ 5 D 1	

Note

A+	4.00
A	3.75
B+	3.50
B	3.00
C+	2.50
C	2.00
D+	1.50
D	1.00
F	0

Problem G. Nurbol hacker

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

This is a continuation of the story about the Aslan and Password task from the last quiz. The story is that Nurbol successfully hacked Aslan's Steam account. Aslan was of course upset, but he doesn't give up. He decided to restore his Steam account. To do this, he wrote in support of Steam. Aslan gave them the nickname of his account. But it is possible for Nurbol to change the nickname of the account. And now Steam employees must understand what the new nickname is. Employees have logs of changing nicknames, the logs consist of n lines. The line itself consists of two words, the old nickname, and the new one. Help employees to display all original nicknames and new nicknames next to them.

Input

The first line is number n ($1 \leq n \leq 1000$) the number of requests to change the nickname. Next n lines consist of two strings, old nickname and new nickname.

Output

The first line is the number q - unique users who changed their nicknames. Next q lines consist of two strings, old nickname and new nickname. (Use map to sort old nicknames)

Examples

standard input	standard output
2 Aslan Nurbol Nurbol HackMachine	1 Aslan HackMachine
6 Sens3i Danya Simple Papa M9snoyPovar AWPMaster IAmNoob IAmPro Papa Sanya IAmPro IAmNoob	4 IAmNoob IAmNoob M9snoyPovar AWPMaster Simple Sanya Sens3i Danya

Note

In the first test nickname "Aslan" was changed to nickname "Nurbol". Then this nickname was changed to "HackMachine". As a result, the original nickname "Aslan" became "HackMachine".

Problem H.

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

You have one letter. Your task is to find "balanced"char in array. "Balanced"char is the smallest in array, but more than your letter.

Input

You are given integer n. n- number of elements in array. Then goes an array. Array has only sorted lowercase letter.

Output

Print the "balanced"letter.

Examples

standard input	standard output
3 c f g a	c
3 c f j f	j
3 c f j j	c
3 c f j k	c

Note

Size of array should be more than 1;

Problem I. Problem C. Azat likes sorting

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 256 megabytes

Azat is a perfectionist and he likes everything to be perfect. Help Azat sort letters alphabetically. good luck!

Input

The input string and only small letters.

Output

Print answer.

Examples

standard input	standard output
ijnubhygtfcrdx	bcd fghijnrtuvxy
asdzxchfg	acdfghsxz

Note

you cannot use the sort function