Problem A. Transaction

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

You are an employee at private company that provides machines with drinks and snacks. Your boss gave you the task to write program for one of such machine. This program should return a surrender to customer with minimum amount of coins. Please note that the machines have only particular types of coins as 1, 2, 5, 10, 20, 50 and 100.

You will be given the number of customers - N. Your task is say "Transaction accepted!"and give coins to the customer, if you can give a surrender. "Transaction stopped!"otherwise.

Input

The first line of the input contains 7 integers C_i - inital number of coins for each type. ($1 \leqslant C_i \leqslant 10^5$)

The second line of the input contains integer N - the number of customers ($1 \leqslant N \leqslant 10^3$).

The next N lines contain only integer N_i - amount of surrender you must give to the customer ($1 \leqslant N_i \leqslant 10^5$).

Output

For each customer, print one line with your answer.

"Transaction accepted! if you can give surrender, "Transaction stopped! otherwise.

Example

standard input	standard output
10 10 10 10 10 10 10 3 1000 1000 85	Transaction accepted! Transaction stopped! Transaction accepted!

Note

After each customer number of coins decrease.

Note 2:

After first cumstomer, number of each types of coins: 10 10 10 10 10 10 0.

To second customer you can not give surrender.

After third cumstomer, number of each types of coins: 10 10 9 9 9 9 0.

Problem B. Triforce

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

Newfags can't triforce. Proof that you are an oldfag!

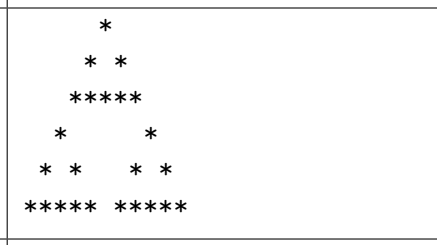
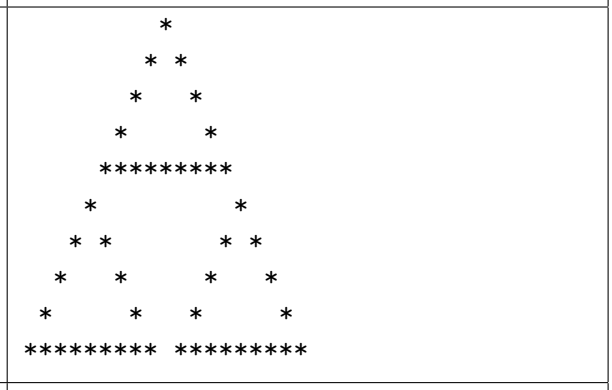
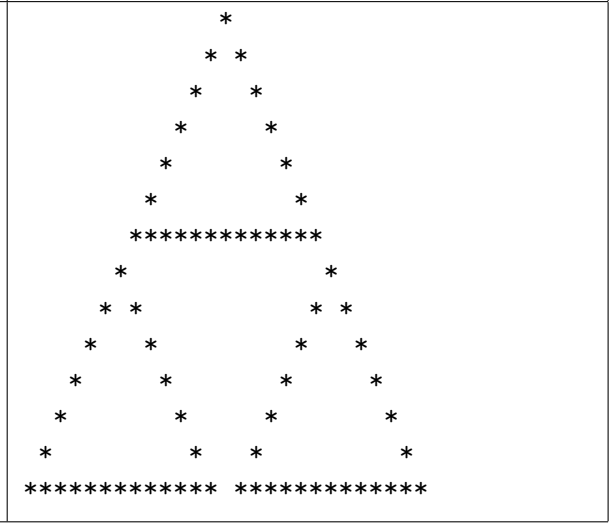
Input

The only line of input contains one integer n ($1 \le n \le 100$)

Output

Print three triangles of size n in special format (see examples).

Examples

standard input	standard output
1	
3	
5	
7	

Problem C. Fence

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

Temirlan wants to paint his fence, but because of preparation to the semi-final of ACM ICPC he asked you to paint his fence. There is a fence of infinite length. You want to paint this fence in N different colors. During the i-th operation you will paint first l_i meters of fence in color i. Your task is to say how many colors will be visible after N operations.

Input

The first line of the input contains integer N - the number of colors ($1 \leqslant N \leqslant 10^5$).

The second line contains N integers l_i - meters of fence to be painted at the i-th operation ($1 \leqslant l_i \leqslant 10^5$).

Output

Print the only integer - number of colors that will be seen in the end.

Examples

standard input	standard output
3 1 3 5	1
4 1 3 7 5	2

Problem D. 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 ($1 \le n \le 10^5$). Each of the next n lines contains information about the i-th student: his lastname, firstname, an integer m_i ($1 \le m_i \le 10$) - 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 Issenbayev Yernur 4 A 4 D+ 2 B 3 A+ 4 Yermekbayeva Diana 3 A+ 4 B+ 3 B 1 Kadyrov Asman 2 A+ 4 A+ 4 Stepanenko Ivan 3 C+ 3 F 1 A+ 5 Bissimbayev Arystan 3 A+ 4 A+ 5 D 1	Stepanenko Ivan 3.056 Issenbayev Yernur 3.308 Yermekbayeva Diana 3.688 Bissimbayev Arystan 3.700 Kadyrov Asman 4.000

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 E. Perfect pizza

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Yernur and Diana want to make the perfect pizza. There are n ingredients in the shop, also they have a list of m pairs of matching ingredients. They only have one ingredient, but they want to buy more, which can be combined with the given one. Help them to make sorted shopping list.

Input

First line of input contains one integer n ($1 \le n \le 10^3$), number of available ingredients. Second line contains n space separated ingredients, an ingredient given as string s ($1 \le |s| \le 100$). The third line contains an integer m ($1 \le m \le 10^5$), number of pairs of matching ingredients. The next m lines of input contain pair of matching ingredients s and t. The last line contains one ingredient Yernur and Diana have.

Output

The first line contains one integer, number of ingredients they have to buy. Next line contains sorted space separated list of ingredients. If there are no ingredients matching with given one, you should only print 0.

Examples

standard input	standard output
5 sausage cheese mushrooms salad pepper 4 sausage cheese mushrooms sausage salad pepper mushrooms cheese sausage	2 cheese mushrooms
7 tomato chicken meatballs pineapple ham olives onion 6 pineapple chicken tomato meatballs ham onion olives tomato ham olives chicken tomato tomato	3 chicken meatballs olives

Problem F. Adding Reversed Numbers

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

In this problem you need to add 2 reversed number.

Reversed number is a number written in arabic numerals but the order of digits is reversed. The first digit becomes last and vice versa. For example, number is 1245 will be 5421. Note that all the leading zeros are omitted. That means if the number ends with a zero, the zero is lost by reversing (e.g. 1200 gives 21). Also note that the reversed number never has any trailing zeros.

Your task is to add two reversed numbers and output their reversed sum. Of course, the result is not unique because any particular number is a reversed form of several numbers (e.g. 21 could be 12, 120 or 1200 before reversing). Thus we must assume that no zeros were lost by reversing (e.g. assume that the original number was 12).

Input

The input consists of N cases (equal to about 10000). The first line of the input contains only positive integer N. Then follow the cases. Each case consists of exactly one line with two positive integers separated by space. These are the reversed numbers you are to add.

Output

For each case, print exactly one line containing only one integer - the reversed sum of two reversed numbers. Omit any leading zeros in the output.

Example

standard input	standard output
3 24 1 4358 754 305 794	34 1998 1

Problem G. Sharky and primes

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

Sharky wants to find two prime numbers which in sum are the given number N.

It is known that any even number greater than 2 can be represented as a sum of 2 primes, and there can be several such expansions. For the first time, the hypothesis of the existence of this decomposition was formulated by the mathematician C. Goldbach.

It is required to write a program that, according to Goldbach's assertion, decomposes a given even number. Of all pairs of primes, the sum of which is equal to a given number, help Sharky to find the pair containing the smallest prime number.

Input

You are given even integer N $(3 < N < 999)$

Output

Print separately two prime numbers, the sum of which is equal to N. The smallest number is displayed first.

Examples

standard input	standard output
686	3 683
44	3 41
992	73 919

Problem H. Vigenere cipher

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

Today you will need to write a program that will encrypt the string using the Vigenere cipher.

Vigenere Cipher is a method of encrypting alphabetic text. It uses a simple form of polyalphabetic substitution. The encryption of the original text is done using the Vigenere table.

The Vigenere cipher uses a 26x26 table with A to Z as the row heading and column heading. The first row of this table has the 26 English letters. Starting with the second row, each row has the letters shifted to the left one position in a cyclic way. For example, when B is shifted to the first position on the second row, the letter A moves to the end.

Encryption

Let's take this plaintext as an example: $flower$.

After finalizing the plaintext, the person encrypting would then pick a secret key, which would help encrypt and decrypt the message. Our example secret key here is: dog .

The next step is repeating the secret key enough times so its length matches the plain text.

$flower$

$dogdog$

Take one letter from the plaintext group and a letter from the secret key group, and find the entry in the Vigenere Table where the row and column intersect. For this example, the first letter of the encrypted cipher text is i.

Input

First line contains the plaintext - string A.

Second line conrains a secret key - string B.

It is guaranteed that both strings will contain only lowercase Latin letters.

Output

Print encrypted string in one line.

Examples

standard input	standard output
flower dog	izuzsx
boriska mama	nodiekm
happynewyear kbtu	rbijioxqiftl

Note

for a better understanding of the Vigenere cipher, follow the link

https://www.boxentriq.com/code-breaking/vigenere-cipher

Problem I. New word?

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

Boris wants to create new words from the existing ones. He has two words - A and B. He wants to find a new word N that contains both A and B as a substring, and it will be the shortest of all possible strings.

A substring of a string is a contiguous subsequence of that string. So, string *kotik* is substring of string *kotikirulyat*, but string *cat* is not.

Input

The first line of the input will contain string A . The second line of the input will contains string B. It is guaranteed that both strings will contain only lowercase Latin letters.

Output

Print one string - N

Examples

standard input	standard output
progress simple	progressimple
boriska karamelka	boriskaramelka
cat dog	catdog
cookingcookies cook	cookingcookies

Problem J. Understandable have a nice day

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

You are given two strings s and t. You need to check how many steps have been taken to get the string t from string s by cyclic shift to the right. If it is not possible output "Understandable have a nice day".

Input

First line string s ($1 \leq s \leq 1000$). Second line string t ($1 \leq s \leq 1000$).

Output

Integer - how many steps or "Understandable have a nice day"without quotes.

Examples

standard input	standard output
abcde deabc	2
abcde abcde	0
asdfghjkl asdfghjkk	Understandable have a nice day

Problem K. 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 S1mple Papa M9snoyPovar AWPMaster IAmNoob IAmPro Papa Sanya IAmPro IAmNoob	4 IAmNoob IAmNoob M9snoyPovar AWPMaster S1mple 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 L. Chrono Crusader

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

Dear freshmen's, how do you like student life in KBTU? And have you joined any clubs? If not, you are missing out on a lot. For example, there is one club in our university. The members of this club love to get together and play different games. However, the members of this club are highly erudite and only play unusual games. One of the club members suggested a new game called "Chrono Crusader". The rules of the game are pretty simple. There are n participants, the i-th participant chose the number a_i. The winner of the game is such a participant that the number he chose is unique (i. e. nobody else chose this number except him) and is minimal (i. e. among all unique values of a the minimum one is the winning one). Your task is to find the index of the participant who won the game. Indexing is 1-based, i. e. the participants are numbered from 1 to n. But what if there is no winner? Then the member who is the fastest to say "ZA WARUDO"wins! Interesting isn't it?

Input

The first line - one integer t ($1 \leq t \leq 1000$) - the number of test cases. Then t test cases. The first line of the test case contains integer n ($1 \leq n \leq 1000$) - the number of participants. The second line of the test case contains n integers a1, a2,. . . , an ($1 \leq a_i \leq n$), where ai is the i-th participant chosen number.

Output

For each test case, print the answer - the index of the participant who won the game (or "ZA WARUDO"without quotes if there is no winner).

Example

standard input	standard output
5 7 6 1 4 7 4 3 2 6 6 5 1 4 6 1 6 5 4 4 3 3 2 10 8 3 2 4 8 5 5 3 7 3 6 1 2 1 4 4 2	2 4 6 3 ZA WARUDO

Note

Good luck:)