

Problem A. Random pair generator

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

You're testing a random generator of unordered pair of numbers (so consider $(1, 2)$ same as $(2, 1)$). When the generator generates some pair of numbers, you have to answer how many times this pair was repeated previously by the machine.

Input

The first line of input contains one integer n ($1 \leq n \leq 10^5$). The next n lines contains two numbers a, b ($-10^9 \leq a, b \leq 10^9$), elements of an unordered pair that were generated.

Output

For each pair of numbers you should print how many times it was occurred before in separate line.

Examples

standard input	standard output
4	0
1 1	0
2 3	0
4 5	0
6 7	
5	0
1 0	1
0 1	0
2 7	0
8 8	0
2 8	

Problem B. The Da Vinci Code - cipher

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

The heroes of the book The Da Vinci Code are faced with another riddle. They need to decipher the word using the Atbash cipher.

The Atbash cipher is a cipher formed by taking the English alphabet (26 letters) and mapping it to its reverse. So that the first letter becomes the last letter, the second letter becomes the second to last letter, and so on. The encryption rule consists of replacing the i -th letter of the alphabet with the letter $n-i+1$, where n is the number of letters in the alphabet. For example, the word *crystal* will be encrypted as *xibhgzo*.

Input

You are given lowercase string s - word that should be decrypted

Output

Print answer - decrypted word in one line

Examples

standard input	standard output
crystal	xibhgzo
hello	svool

Problem C. The Da Vinci Code - anagram

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

We continue our journey through the amazing book The Da Vinci Code. This time, Sophie Neva needs to unravel the word hidden under the anagram. To do this, she wants to find out all variants of anagrams for a given word.

An anagram is a word formed by rearranging the letters of a different word or phrase, typically using all the original letters exactly once. For example, the word *binary* can be rearranged into *brainy*, also the word *adobe* into *abode*.

Input

You are given string *s* - initial word.

Output

Print all variants of the anagram for the given word in lexicographic order, each separated on a new line.

Example

standard input	standard output
cat	The anagram variants for string cat are: act atc cat cta tac tca

Note

Hint: use `< algorithm >` library and function `nextpermutation`

Problem D. Polyglot

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

Daniil started learning English. As in the Kazakh or Russian language, every word has its origin, we detect it by finding the *root* of the word. Aykhan really interested in words with root T . But for some words, it is too hard to determine the root. Help Aykhan with this task.

For the given word S find all possible starting positions where root T can be found.

Input

First line contains string - S . ($1 \leq S.size(), \leq 50000$)

Second line contains string - T , which is the root. ($1 \leq T.size() \leq 50000$)

Strings contain only lowercase letters.

Output

Print out founded starting indexes of T in S .

Example

standard input	standard output
ababbababa aba	0 5 7

Problem E. 2020

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

Assyl loves solving hard problems like "min cost flow" and read topics like pointers, but sometimes he can struggle with easy ones.

Given a year number, find the minimum year number which is strictly larger than the given one and has only distinct digits.

Help Assyl to solve this easy problem.

Input

The single line contains integer y — the year number. ($999 < y < 10000$)

Output

Print a single integer — the minimum year number that is strictly larger than y and all its digits are distinct. It is guaranteed that the answer exists.

Examples

standard input	standard output
2020	2031
1987	2013

Problem F. Max Word

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

Given a string s consists of some words separated by spaces, print the the longest word in the string. If there is several longest words, print first one.

Input

The single line contains a string S ($0 < S.size() < 100000$).

Output

Print the longest word.

Examples

standard input	standard output
another one bites the dust	another
good luck have fun	good

Problem G. Convert

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

You are given string - S . To replace the uppercase letter with lowercase you have to pay A tenge. In order to replace the lowercase letter with uppercase, you have to pay B tenge. Your task is - to find the minimum cost to convert all chars of the given string to any register.

Input

The first line contains numbers N , A , B ($1 < N, A, B < 100000$). Where, N - string size, A - cost to replace from uppercase to lowercase, B - cost to replace from lowercase to uppercase.

The second line contains a string S .

Output

Print the minimum cost.

Examples

standard input	standard output
20 10 5 easYqUestionEasylife	30
7 100 1 keepcalm	0