Codeforces Beta Round #54 (Div. 2)

A. Chat room

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya has recently learned to type and log on to the Internet. He immediately entered a chat room and decided to say hello to everybody. Vasya typed the word *S*. It is considered that Vasya managed to say hello if several letters can be deleted from the typed word so that it resulted in the word "hello". For example, if Vasya types the word "ahhellllloou", it will be considered that he said hello, and if he types "hlelo", it will be considered that Vasya got misunderstood and he didn't manage to say hello. Determine whether Vasya managed to say hello by the given word *S*.

Input

The first and only line contains the word *S*, which Vasya typed. This word consisits of small Latin letters, its length is no less that 1 and no more than 100 letters.

Output

If Vasya managed to say hello, print "YES", otherwise print "NO".

Examples

input
ahhellllloou
output
YES

input
hlelo
output
NO

B. Coins

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

In Berland a money reform is being prepared. New coins are being introduced. After long economic calculations was decided that the most expensive coin should possess the denomination of exactly n Berland dollars. Also the following restriction has been introduced for comfort: the denomination of each coin **should be divisible** by the denomination of any cheaper coin. It is known that among all the possible variants the variant with the largest number of new coins will be chosen. Find this variant. Print in the order of decreasing of the coins' denominations.

Input

The first and only line contains an integer n ($1 \le n \le 10^6$) which represents the denomination of the most expensive coin.

Output

Print the denominations of all the coins in the order of decreasing. The number of coins must be the largest possible (with the given denomination n of the most expensive coin). Also, the denomination of every coin must be divisible by the denomination of any cheaper coin. Naturally, the denominations of all the coins should be different. If there are several solutins to that problem, print any of them.

Examples

input
10
output
10 5 1

input
4
output
4 2 1

input
3
output
3 1

C. Trees

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

On Bertown's main street n trees are growing, the tree number i has the height of a_i meters ($1 \le i \le n$). By the arrival of the President of Berland these trees were decided to be changed so that their heights formed a *beautiful* sequence. This means that the heights of trees on ends (the 1st one and the n-th one) should be equal to each other, the heights of the 2-nd and the $(n - 1)$-th tree must also be equal to each other, at that the height of the 2-nd tree should be larger than the height of the first tree by 1, and so on. In other words, the heights of the trees, standing at equal distance from the edge (of one end of the sequence) must be equal to each other, and with the increasing of the distance from the edge by 1 the tree height must also increase by 1. For example, the sequences "2 3 4 5 5 4 3 2" and "1 2 3 2 1" are beautiful, and '1 3 3 1" and "1 2 3 1" are not.

Changing the height of a tree is a very expensive operation, using advanced technologies invented by Berland scientists. In one operation you can choose any tree and change its height to any number, either increase or decrease. Note that even after the change the height should remain a positive integer, i. e, it can't be less than or equal to zero. Identify the smallest number of changes of the trees' height needed for the sequence of their heights to become beautiful.

Input

The first line contains integer n ($1 \le n \le 10^5$) which is the number of trees. The second line contains integers a_i ($1 \le a_i \le 10^5$) which are the heights of the trees.

Output

Print a single number which is the minimal number of trees whose heights will have to be changed for the sequence to become beautiful.

Examples

input
3 2 2 2
output
1

input
4 1 2 2 1
output
0

D. Calendar

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

BerOilGasDiamondBank has branches in n cities, at that n is an even number. The bank management wants to publish a calendar with the names of all those cities written in two columns: the calendar should consist of exactly $n / 2$ lines of strictly equal length, each of which contains exactly two names and exactly one separator character between them. The name of every city should be used in the calendar exactly once. For historical reasons the symbol d is used as the separator of words in the calendar.

The BerOilGasDiamondBank management wants to show that all its branches are equally important to it, that's why the order of their appearance in the calendar should be following: if we "glue"(concatinate) all the $n / 2$ calendar lines (from top to bottom) to make a single line, then the lexicographically minimal line is obtained. No separator character will be used to separate calendar lines. For example, if the lines are "bertown!berville", "newberville!bera", then the resulting line is "bertown!bervillenewberville!bera". In some sense one has to find the lexicographically minimal calendar, where the comparison of calendars happens line by line.

Help BerOilGasDiamondBank and construct the required calendar.

Input

The first line contains an integer n ($1 \le n \le 10^4$, n is even) which is the number of branches. Then follow n lines which are the names of the cities. All the names consist of lowercase Latin letters; their lengths are no less than 1 and no more than 10 symbols. The next line contains a single symbol d (d has an ASCII-code from 33 to 126 inclusively, excluding lowercase Latin letters) which is the separator between words in the calendar lines. It is guaranteed that the calendar is possible to be constructed and all the names are different.

Output

Print $n / 2$ lines of similar length which are the required calendar. Every line should contain exactly two words and exactly one separator between them. If there are several solutions, print the lexicographically minimal one. The lexicographical comparison of lines is realized by the "<" operator in the modern programming languages.

Examples

input
4 b aa hg c .
output
aa.b c.hg

input
2 aa a !
output
a!aa

input
2 aa a |
output
aa|a

E. Expression

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

One day Vasya was solving arithmetical problems. He wrote down an expression $a + b = c$ in his notebook. When the teacher checked Vasya's work it turned out that Vasya had solved the problem incorrectly. Now Vasya tries to find excuses. He says that he simply forgot to write down several digits in numbers a, b and c, but he can't remember what numbers they actually were. Help Vasya, find such numbers x, y and z, with which the following conditions are met:

- $x + y = z$,
- from the expression $x + y = z$ several digits can be erased in such a way that the result will be $a + b = c$,
- the expression $x + y = z$ should have the minimal length.

Input

The first and only input line contains the expression $a + b = c$ ($1 \le a, b, c \le 10^6$, a, b and c don't contain leading zeroes) which is the expression Vasya wrote down.

Output

Print the correct expression $x + y = z$ (x, y and z are non-negative numbers without leading zeroes). The expression $a + b = c$ must be met in $x + y = z$ as a subsequence. The printed solution should have the minimal possible number of characters. If there are several such solutions, you can print any of them.

Examples

input
2+4=5
output
21+4=25

input
1+1=3
output
1+31=32

input
1+1=2
output
1+1=2