Problem A. Tormuz

Time limit	1000 ms
Mem limit	65536 kB
Input file	stdin
Output file	stdout

One hot summer day Pete and his friend Billy decided to buy a watermelon. They chose the biggest and the ripest one, in their opinion. After that the watermelon was weighed, and the scales showed w kilos. They rushed home, dying of thirst, and decided to divide the berry, however they faced a hard problem.

Pete and Billy are great fans of even numbers, that's why they want to divide the watermelon in such a way that each of the two parts weighs even number of kilos, at the same time it is not obligatory that the parts are equal. The boys are extremely tired and want to start their meal as soon as possible, that's why you should help them and find out, if they can divide the watermelon in the way they want. For sure, each of them should get a part of positive weight.

Input

The first (and the only) input line contains integer number w ($1 \le w \le 100$) — the weight of the watermelon bought by the boys.

Output

Print `YES`, if the boys can divide the watermelon into two parts, each of them weighing even number of kilos; and `NO` in the opposite case.

Examples

Input	Output
8	YES

Note

For example, the boys can divide the watermelon into two parts of 2 and 6 kilos respectively (another variant — two parts of 4 and 4 kilos).

Problem B. Onek boro sobdo

Time limit	1000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

Sometimes some words like "`localization`" or "`internationalization`" are so long that writing them many times in one text is quite tiresome.

Let's consider a word *too long*, if its length is **strictly more** than 10 characters. All too long words should be replaced with a special abbreviation.

This abbreviation is made like this: we write down the first and the last letter of a word and between them we write the number of letters between the first and the last letters. That number is in decimal system and doesn't contain any leading zeroes.

Thus, "`localization`" will be spelt as "`l10n`", and "`internationalization`» will be spelt as "`i18n`".

You are suggested to automatize the process of changing the words with abbreviations. At that all too long words should be replaced by the abbreviation and the words that are not too long should not undergo any changes.

Input

The first line contains an integer n ($1 \le n \le 100$). Each of the following n lines contains one word. All the words consist of lowercase Latin letters and possess the lengths of from 1 to 100 characters.

Output

Print n lines. The i-th line should contain the result of replacing of the i-th word from the input data.

Examples

Input	Output
4 word localization internationalization pneumonoultramicroscopicsilicovolcanoconiosis	word l10n i18n p43s

Problem C. Group

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

One day three best friends Petya, Vasya and Tonya decided to form a team and take part in programming contests. Participants are usually offered several problems during programming contests. Long before the start the friends decided that they will implement a problem if at least two of them are sure about the solution. Otherwise, the friends won't write the problem's solution.

This contest offers n problems to the participants. For each problem we know, which friend is sure about the solution. Help the friends find the number of problems for which they will write a solution.

Input

The first input line contains a single integer n ($1 \le n \le 1000$) — the number of problems in the contest. Then n lines contain three integers each, each integer is either 0 or 1. If the first number in the line equals 1, then Petya is sure about the problem's solution, otherwise he isn't sure. The second number shows Vasya's view on the solution, the third number shows Tonya's view. The numbers on the lines are separated by spaces.

Output

Print a single integer — the number of problems the friends will implement on the contest.

Examples

Input	Output
3 1 1 0 1 1 1 1 0 0	2

Input	Output
2 1 0 0 0 1 1	1

Note

In the first sample Petya and Vasya are sure that they know how to solve the first problem and all three of them know how to solve the second problem. That means that they will write solutions for these problems. Only Petya is sure about the solution for the third problem, but that isn't enough, so the friends won't take it.

In the second sample the friends will only implement the second problem, as Vasya and Tonya are sure about the solution.

Problem D. Porer gontobbo

Time limit	3000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

"Contestant who earns a score equal to or greater than the k-th place finisher's score will advance to the next round, as long as the contestant earns a positive score..." — an excerpt from contest rules.

A total of n participants took part in the contest ($n \geq k$), and you already know their scores. Calculate how many participants will advance to the next round.

Input

The first line of the input contains two integers n and k ($1 \leq k \leq n \leq 50$) separated by a single space.

The second line contains n space-separated integers $a_1, a_2, ..., a_n$ ($0 \leq a_i \leq 100$), where a_i is the score earned by the participant who got the i-th place. The given sequence is non-increasing (that is, for all i from 1 to n - 1 the following condition is fulfilled: $a_i \geq a_{i+1}$).

Output

Output the number of participants who advance to the next round.

Examples

Input	Output
8 5 10 9 8 7 7 7 5 5	6

Input	Output
4 2 0 0 0 0	0

Note

In the first example the participant on the 5th place earned 7 points. As the participant on the 6th place also earned 7 points, there are 6 advancers.

In the second example nobody got a positive score.

Problem E. Alicer oshud

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

You are given a rectangular board of $M \times N$ squares. Also you are given an unlimited number of standard domino pieces of 2×1 squares. You are allowed to rotate the pieces. You are asked to place as many dominoes as possible on the board so as to meet the following conditions:

1. Each domino completely covers two squares.

2. No two dominoes overlap.

3. Each domino lies entirely inside the board. It is allowed to touch the edges of the board.

Find the maximum number of dominoes, which can be placed under these restrictions.

Input

In a single line you are given two integers M and N — board sizes in squares $(1 \le M \le N \le 16)$.

Output

Output one number — the maximal number of dominoes, which can be placed.

Examples

Input	Output
2 4	4

Input	Output
3 3	4

Problem F. Sundor Dhara

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

You've got a 5×5 matrix, consisting of 24 zeroes and a single number one. Let's index the matrix rows by numbers from 1 to 5 from top to bottom, let's index the matrix columns by numbers from 1 to 5 from left to right. In one move, you are allowed to apply one of the two following transformations to the matrix:

1. Swap two neighboring matrix rows, that is, rows with indexes i and $i + 1$ for some integer i $(1 \le i < 5)$.
2. Swap two neighboring matrix columns, that is, columns with indexes j and $j + 1$ for some integer j $(1 \le j < 5)$.

You think that a matrix looks *beautiful*, if the single number one of the matrix is located in its middle (in the cell that is on the intersection of the third row and the third column). Count the minimum number of moves needed to make the matrix beautiful.

Input

The input consists of five lines, each line contains five integers: the j-th integer in the i-th line of the input represents the element of the matrix that is located on the intersection of the i-th row and the j-th column. It is guaranteed that the matrix consists of 24 zeroes and a single number one.

Output

Print a single integer — the minimum number of moves needed to make the matrix beautiful.

Examples

Input	Output
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3

Input	Output
0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	1

Problem G. Only String

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

Little Petya loves presents. His mum bought him two strings of the same size for his birthday. The strings consist of uppercase and lowercase Latin letters. Now Petya wants to compare those two strings lexicographically. The letters' case does not matter, that is an uppercase letter is considered equivalent to the corresponding lowercase letter. Help Petya perform the comparison.

Input

Each of the first two lines contains a bought string. The strings' lengths range from 1 to 100 inclusive. It is guaranteed that the strings are of the same length and also consist of uppercase and lowercase Latin letters.

Output

If the first string is less than the second one, print "-1". If the second string is less than the first one, print "1". If the strings are equal, print "0". Note that the letters' case is not taken into consideration when the strings are compared.

Examples

Input	Output
aaaa aaaA	0

Input	Output
abs Abz	-1

Input	Output
abcdefg AbCdEfF	1

Note

If you want more formal information about the lexicographical order (also known as the "dictionary order" or "alphabetical order"), you can visit the following site:

- http://en.wikipedia.org/wiki/Lexicographical_order

Problem H. Valo math

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

Xenia the beginner mathematician is a third year student at elementary school. She is now learning the addition operation.

The teacher has written down the sum of multiple numbers. Pupils should calculate the sum. To make the calculation easier, the sum only contains numbers 1, 2 and 3. Still, that isn't enough for Xenia. She is only beginning to count, so she can calculate a sum only if the summands follow in non-decreasing order. For example, she can't calculate sum 1+3+2+1 but she can calculate sums 1+1+2 and 3+3.

You've got the sum that was written on the board. Rearrange the summans and print the sum in such a way that Xenia can calculate the sum.

Input

The first line contains a non-empty string s — the sum Xenia needs to count. String s contains no spaces. It only contains digits and characters "+". Besides, string s is a correct sum of numbers 1, 2 and 3. String s is at most 100 characters long.

Output

Print the new sum that Xenia can count.

Examples

Input	Output
3+2+1	1+2+3

Input	Output
1+1+3+1+3	1+1+1+3+3

Input	Output
2	2

Problem I. Capitalized

Time limit	2000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

Capitalization is writing a word with its first letter as a capital letter. Your task is to capitalize the given word.

Note, that during capitalization all the letters except the first one remains unchanged.

Input

A single line contains a non-empty word. This word consists of lowercase and uppercase English letters. The length of the word will not exceed 10^3.

Output

Output the given word after capitalization.

Examples

Input	Output
ApPLe	ApPLe

Input	Output
konjac	Konjac

Problem J. Chele ba Meye

Time limit	1000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

Those days, many boys use beautiful girls' photos as avatars in forums. So it is pretty hard to tell the gender of a user at the first glance. Last year, our hero went to a forum and had a nice chat with a beauty (he thought so). After that they talked very often and eventually they became a couple in the network.

But yesterday, he came to see "her" in the real world and found out "she" is actually a very strong man! Our hero is very sad and he is too tired to love again now. So he came up with a way to recognize users' genders by their user names.

This is his method: if the number of distinct characters in one's user name is odd, then he is a male, otherwise she is a female. You are given the string that denotes the user name, please help our hero to determine the gender of this user by his method.

Input

The first line contains a non-empty string, that contains only lowercase English letters — the user name. This string contains at most 100 letters.

Output

If it is a female by our hero's method, print "`CHAT WITH HER!`" (without the quotes), otherwise, print "`IGNORE HIM!`" (without the quotes).

Examples

Input	Output
wjmzbmr	CHAT WITH HER!

Input	Output
xiaodao	IGNORE HIM!

Input	Output
sevenkplus	CHAT WITH HER!

Note

For the first example. There are 6 distinct characters in "wjmzbmr". These characters are: "w", "j", "m", "z", "b", "r". So wjmzbmr is a female and you should print "CHAT WITH HER!".