[Juniors] - Warm UP #1

A. Next Round

3 seconds, 256 megabytes

"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.

input
8 5 10 9 8 7 7 7 5 5
output
6

input
4 2 0 0 0 0
output
0

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.

B. Watermelon

1 second, 64 megabytes

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 ($1 \leq w \leq 100$) — 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.

input
8
output
YES

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).

C. Diverse Team

1 second, 256 megabytes

There are n students in a school class, the rating of the i-th student on Codehorses is a_i. You have to form a team consisting of k students ($1 \leq k \leq n$) such that the ratings of all team members **are distinct**.

If it is impossible to form a suitable team, print "`NO`" (without quotes). Otherwise print "`YES`", and then print k distinct numbers which should be the indices of students in the team you form. If there are multiple answers, print any of them.

Input

The first line contains two integers n and k ($1 \leq k \leq n \leq 100$) — the number of students and the size of the team you have to form.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq 100$), where a_i is the rating of i-th student.

Output

If it is impossible to form a suitable team, print "`NO`" (without quotes). Otherwise print "`YES`", and then print k distinct integers from 1 to n which should be the indices of students in the team you form. All the ratings of the students in the team should be distinct. You may print the indices in any order. If there are multiple answers, print any of them.

Assume that the students are numbered from 1 to n.

input
5 3 15 13 15 15 12
output
YES 1 2 5

input
5 4 15 13 15 15 12
output
NO

input
4 4 20 10 40 30
output
YES 1 2 3 4

All possible answers for the first example:

- {1 2 5}
- {2 3 5}
- {2 4 5}

Note that the order does not matter.

D. In Search of an Easy Problem

1 second, 256 megabytes

When preparing a tournament, Codeforces coordinators try treir best to make the first problem as easy as possible. This time the coordinator had chosen some problem and asked n people about their opinions. Each person answered whether this problem is easy or hard.

If at least one of these n people has answered that the problem is hard, the coordinator decides to change the problem. For the given responses, check if the problem is easy enough.

Input

The first line contains a single integer n ($1 \le n \le 100$) — the number of people who were asked to give their opinions.

The second line contains n integers, each integer is either 0 or 1. If i-th integer is 0, then i-th person thinks that the problem is easy; if it is 1, then i-th person thinks that the problem is hard.

Output

Print one word: "EASY" if the problem is easy according to all responses, or "HARD" if there is at least one person who thinks the problem is hard.

You may print every letter in any register: "EASY", "easy", "EaSY" and "eAsY" all will be processed correctly.

input
3 0 0 1
output
HARD

input
1 0
output
EASY

In the first example the third person says it's a hard problem, so it should be replaced.

In the second example the problem easy for the only person, so it doesn't have to be replaced.

E. Helpful Maths

2 seconds, 256 megabytes

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.

input
3+2+1
output
1+2+3

input
1+1+3+1+3
output
1+1+1+3+3

input
2
output
2

F. Stones on the Table

2 seconds, 256 megabytes

There are n stones on the table in a row, each of them can be red, green or blue. Count the minimum number of stones to take from the table so that any two neighboring stones had different colors. Stones in a row are considered neighboring if there are no other stones between them.

Input

The first line contains integer n ($1 \le n \le 50$) — the number of stones on the table.

The next line contains string s, which represents the colors of the stones. We'll consider the stones in the row numbered from 1 to n from left to right. Then the i-th character s equals "R", if the i-th stone is red, "G", if it's green and "B", if it's blue.

Output

Print a single integer — the answer to the problem.

input
3 RRG
output
1

input
5 RRRRR
output
4

input

```
4
BRBG
```

output

```
0
```

G. Beautiful Matrix

2 seconds, 256 megabytes

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.

input

```
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
```

output

```
3
```

input

```
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
```

output

```
1
```

H. Boy or Girl

1 second, 256 megabytes

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).

input

```
wjmzbmr
```

output

```
CHAT WITH HER!
```

input

```
xiaodao
```

output

```
IGNORE HIM!
```

input

```
sevenkplus
```

output

```
CHAT WITH HER!
```

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!`".

I. Lucky Division

2 seconds, 256 megabytes

Petya loves lucky numbers. Everybody knows that lucky numbers are positive integers whose decimal representation contains only the lucky digits **4** and **7**. For example, numbers **47**, **744**, **4** are lucky and **5**, **17**, **467** are not.

Petya calls a number almost lucky if it could be evenly divided by some lucky number. Help him find out if the given number n is almost lucky.

Input

The single line contains an integer n $(1 \le n \le 1000)$ — the number that needs to be checked.

Output

In the only line print "`YES`" (without the quotes), if number n is almost lucky. Otherwise, print "`NO`" (without the quotes).

input

```
47
```

output

```
YES
```

input
16
output
YES

input
78
output
NO

Note that all lucky numbers are almost lucky as any number is evenly divisible by itself.

In the first sample 47 is a lucky number. In the second sample 16 is divisible by 4.

J. Beautiful Year

2 seconds, 256 megabytes

It seems like the year of 2013 came only yesterday. Do you know a curious fact? The year of 2013 is the first year after the old 1987 with only distinct digits.

Now you are suggested to solve the following problem: given a year number, find the minimum year number which is strictly larger than the given one and has only distinct digits.

Input
The single line contains integer y $(1000 \le y \le 9000)$ — the year number.

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

input
1987
output
2013

input
2013
output
2014

K. Insomnia cure

2 seconds, 256 megabytes

«One dragon. Two dragon. Three dragon», — the princess was counting. She had trouble falling asleep, and she got bored of counting lambs when she was nine.

However, just counting dragons was boring as well, so she entertained herself at best she could. Tonight she imagined that all dragons were here to steal her, and she was fighting them off. Every k-th dragon got punched in the face with a frying pan. Every l-th dragon got his tail shut into the balcony door. Every m-th dragon got his paws trampled with sharp heels. Finally, she threatened every n-th dragon to call her mom, and he withdrew in panic.

How many imaginary dragons suffered moral or physical damage tonight, if the princess counted a total of d dragons?

Input
Input data contains integer numbers k, l, m, n and d, each number in a separate line ($1 \le k, l, m, n \le 10$, $1 \le d \le 10^5$).

Output
Output the number of damaged dragons.

input
1 2 3 4 12
output
12

input
2 3 4 5 24
output
17

In the first case every first dragon got punched with a frying pan. Some of the dragons suffered from other reasons as well, but the pan alone would be enough.

In the second case dragons 1, 7, 11, 13, 17, 19 and 23 escaped unharmed.

L. Rewards

1 second, 256 megabytes

Bizon the Champion is called the Champion for a reason.

Bizon the Champion has recently got a present — a new glass cupboard with n shelves and he decided to put all his presents there. All the presents can be divided into two types: medals and cups. Bizon the Champion has a_1 first prize cups, a_2 second prize cups and a_3 third prize cups. Besides, he has b_1 first prize medals, b_2 second prize medals and b_3 third prize medals.

Naturally, the rewards in the cupboard must look good, that's why Bizon the Champion decided to follow the rules:

- any shelf cannot contain both cups and medals at the same time;
- no shelf can contain more than five cups;
- no shelf can have more than ten medals.

Help Bizon the Champion find out if we can put all the rewards so that all the conditions are fulfilled.

Input
The first line contains integers a_1, a_2 and a_3 $(0 \le a_1, a_2, a_3 \le 100)$. The second line contains integers b_1, b_2 and b_3 $(0 \le b_1, b_2, b_3 \le 100)$. The third line contains integer n $(1 \le n \le 100)$.

The numbers in the lines are separated by single spaces.

Output
Print "YES" (without the quotes) if all the rewards can be put on the shelves in the described manner. Otherwise, print "NO" (without the quotes).

input

```
1 1 1
1 1 1
4
```

output

```
YES
```

input

```
1 1 3
2 3 4
2
```

output

```
YES
```

input

```
1 0 0
1 0 0
1
```

output

```
NO
```

M. Business trip

2 seconds, 256 megabytes

What joy! Petya's parents went on a business trip for the whole year and the playful kid is left all by himself. Petya got absolutely happy. He jumped on the bed and threw pillows all day long, until...

Today Petya opened the cupboard and found a scary note there. His parents had left him with duties: he should water their favourite flower all year, each day, in the morning, in the afternoon and in the evening. "Wait a second!" — thought Petya. He know for a fact that if he fulfills the parents' task in the i-th $(1 \le i \le 12)$ month of the year, then the flower will grow by a_i centimeters, and if he doesn't water the flower in the i-th month, then the flower won't grow this month. Petya also knows that try as he might, his parents won't believe that he has been watering the flower if it grows strictly less than by k centimeters.

Help Petya choose the minimum number of months when he will water the flower, given that the flower should grow no less than by k centimeters.

Input

The first line contains exactly one integer k $(0 \le k \le 100)$. The next line contains twelve space-separated integers: the i-th $(1 \le i \le 12)$ number in the line represents a_i $(0 \le a_i \le 100)$.

Output

Print the only integer — the minimum number of months when Petya has to water the flower so that the flower grows no less than by k centimeters. If the flower can't grow by k centimeters in a year, print `-1`.

input

```
5
1 1 1 1 2 2 3 2 2 1 1 1
```

output

```
2
```

input

```
0
0 0 0 0 0 0 0 1 1 2 3 0
```

output

```
0
```

input

```
11
1 1 4 1 1 5 1 1 4 1 1 1
```

output

```
3
```

Let's consider the first sample test. There it is enough to water the flower during the seventh and the ninth month. Then the flower grows by exactly five centimeters.

In the second sample Petya's parents will believe him even if the flower doesn't grow at all $(k = 0)$. So, it is possible for Petya not to water the flower at all.

N. Anton and Digits

1 second, 256 megabytes

Recently Anton found a box with digits in his room. There are k_2 digits 2, k_3 digits 3, k_5 digits 5 and k_6 digits 6.

Anton's favorite integers are 32 and 256. He decided to compose this integers from digits he has. He wants to make the sum of these integers as large as possible. Help him solve this task!

Each digit can be used no more than once, i.e. the composed integers should contain no more than k_2 digits 2, k_3 digits 3 and so on. Of course, unused digits are not counted in the sum.

Input

The only line of the input contains four integers k_2, k_3, k_5 and k_6 — the number of digits 2, 3, 5 and 6 respectively $(0 \le k_2, k_3, k_5, k_6 \le 5 \cdot 10^6)$.

Output

Print one integer — maximum possible sum of Anton's favorite integers that can be composed using digits from the box.

input

```
5 1 3 4
```

output

```
800
```

input

```
1 1 1 1
```

output

```
256
```

In the first sample, there are five digits 2, one digit 3, three digits 5 and four digits 6. Anton can compose three integers 256 and one integer 32 to achieve the value $256 + 256 + 256 + 32 = 800$. Note, that there is one unused integer 2 and one unused integer 6. They are not counted in the answer.

In the second sample, the optimal answer is to create on integer 256, thus the answer is 256.

O. Random Teams

1 second, 256 megabytes

n participants of the competition were split into m teams in some manner so that each team has at least one participant. After the competition each pair of participants from the same team became friends.

Your task is to write a program that will find the minimum and the maximum number of pairs of friends that could have formed by the end of the competition.

Input
The only line of input contains two integers n and m, separated by a single space ($1 \le m \le n \le 10^9$) — the number of participants and the number of teams respectively.

Output
The only line of the output should contain two integers k_{min} and k_{max} — the minimum possible number of pairs of friends and the maximum possible number of pairs of friends respectively.

input
5 1
output
10 10

input
3 2
output
1 1

input
6 3
output
3 6

In the first sample all the participants get into one team, so there will be exactly ten pairs of friends.

In the second sample at any possible arrangement one team will always have two participants and the other team will always have one participant. Thus, the number of pairs of friends will always be equal to one.

In the third sample minimum number of newly formed friendships can be achieved if participants were split on teams consisting of 2 people, maximum number can be achieved if participants were split on teams of 1, 1 and 4 people.

P. Non-square Equation

1 second, 256 megabytes

Let's consider equation:

$$x^2 + s(x) \cdot x - n = 0,$$

where x, n are positive integers, $s(x)$ is the function, equal to the sum of digits of number x in the decimal number system.

You are given an integer n, find the smallest positive integer root of equation x, or else determine that there are no such roots.

Input
A single line contains integer n ($1 \le n \le 10^{18}$) — the equation parameter.

Please, do not use the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use `cin`, `cout` streams or the `%I64d` specifier.

Output
Print -1, if the equation doesn't have integer positive roots. Otherwise print such smallest integer x ($x > 0$), that the equation given in the statement holds.

input
2
output
1

input
110
output
10

input
4
output
-1

In the first test case $x = 1$ is the minimum root. As $s(1) = 1$ and $1^2 + 1 \cdot 1 - 2 = 0$.

In the second test case $x = 10$ is the minimum root. As $s(10) = 1 + 0 = 1$ and $10^2 + 1 \cdot 10 - 110 = 0$.

In the third test case the equation has no roots.

Q. Multiplication Table

1 second, 256 megabytes

Let's consider a table consisting of n rows and n columns. The cell located at the intersection of i-th row and j-th column contains number $i \times j$. The rows and columns are numbered starting from 1.

You are given a positive integer x. Your task is to count the number of cells in a table that contain number x.

Input
The single line contains numbers n and x ($1 \le n \le 10^5$, $1 \le x \le 10^9$) — the size of the table and the number that we are looking for in the table.

Output
Print a single number: the number of times x occurs in the table.

input
10 5
output
2

input
6 12
output
4

input
5 13
output
0

A table for the second sample test is given below. The occurrences of number 12 are marked bold.

R. Infinite Sequence

1 second, 256 megabytes

Vasya likes everything infinite. Now he is studying the properties of a sequence s, such that its first element is equal to a ($s_1 = a$), and the difference between any two neighbouring elements is equal to c ($s_i - s_{i-1} = c$). In particular, Vasya wonders if his favourite integer b appears in this sequence, that is, there exists a positive integer i, such that $s_i = b$. Of course, you are the person he asks for a help.

Input

The first line of the input contain three integers a, b and c ($-10^9 \le a, b, c \le 10^9$) — the first element of the sequence, Vasya's favorite number and the difference between any two neighbouring elements of the sequence, respectively.

Output

If b appears in the sequence s print "YES" (without quotes), otherwise print "NO" (without quotes).

input
1 7 3
output
YES

input
10 10 0
output
YES

input
1 -4 5
output
NO

input
0 60 50
output
NO

In the first sample, the sequence starts from integers $1, 4, 7$, so 7 is its element.

In the second sample, the favorite integer of Vasya is equal to the first element of the sequence.

In the third sample all elements of the sequence are greater than Vasya's favorite integer.

In the fourth sample, the sequence starts from $0, 50, 100$, and all the following elements are greater than Vasya's favorite integer.

S. Bachgold Problem

1 second, 256 megabytes

Bachgold problem is very easy to formulate. Given a positive integer n represent it as a sum of **maximum possible** number of prime numbers. One can prove that such representation exists for any integer greater than 1.

Recall that integer k is called prime if it is greater than 1 and has exactly two positive integer divisors — 1 and k.

Input

The only line of the input contains a single integer n ($2 \le n \le 100\,000$).

Output

The first line of the output contains a single integer k — maximum possible number of primes in representation.

The second line should contain k primes with their sum equal to n. You can print them in any order. If there are several optimal solution, print any of them.

input
5
output
2 2 3

input
6
output
3 2 2 2

T. Economy Game

1 second, 256 megabytes

Kolya is developing an economy simulator game. His most favourite part of the development process is in-game testing. Once he was entertained by the testing so much, that he found out his game-coin score become equal to 0.

Kolya remembers that at the beginning of the game his game-coin score was equal to n and that he have bought only some houses (for $1\,234\,567$ game-coins each), cars (for $123\,456$ game-coins each) and computers (for $1\,234$ game-coins each).

Kolya is now interested, whether he could have spent all of his initial n game-coins buying only houses, cars and computers or there is a bug in the game. Formally, is there a triple of non-negative integers a, b and c such that $a \times 1\,234\,567 + b \times 123\,456 + c \times 1\,234 = n$?

Please help Kolya answer this question.

Input

The first line of the input contains a single integer n ($1 \le n \le 10^9$) — Kolya's initial game-coin score.

Output

Print "YES" (without quotes) if it's possible that Kolya spent all of his initial n coins buying only houses, cars and computers. Otherwise print "NO" (without quotes).

input
1359257
output
YES

input
17851817
output
NO

In the first sample, one of the possible solutions is to buy one house, one car and one computer, spending $1\,234\,567 + 123\,456 + 1234 = 1\,359\,257$ game-coins in total.
