Submit a solution for A-187089. Nearest number

Time limit: 3 s

Real time limit: 6 s

Memory limit: 256M

Problem A: 187089. Nearest number

You are given list of integers and an integer k. Find nearest to k number in the list. Distance between numbers is defined as absolute value of their difference. If there are multiple such numbers, choose the first one.

Input format

The first line of input contains an integer n, number elements in the list ($1 \le n \le 10^6$). Next line contains n integers, values of the list ($-10^8 \le a_i \le 10^8$). The last line contains an integer k ($-10^8 \le k \le 10^8$).

Output format

Print the offset from the head of list of the nearest to k number from the list. If there are multiple answers, choose the first one (with smaller offset).

Examples

Input

```
6
7 8 -10 4 2 -1
5
```

Output

```
3
```

Input

```
3
1 2 3
-10
```

Output

```
0
```

Input

```
5
1 1 1 1 1
1
```

Output

```
0
```

Input

```
6
1 2 90 32 2 2
10
```

Output

```
1
```

Notes

In the first example, the closest number to 5 is 4, which offset is 3.

In the second example, the closest number to -10 is 1. Its offset is 0.

In the third example, distance to k is equal for all numbers of the offset. So we will take first of them (with offset 0).

In the last example, the closest number to 10 is 2, so we take the offset of its first occurrence – 1.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for B-191556. Don't get a penalty!

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem B: 191556. Don't get a penalty!

There're lots of Sergek cameras in our city, and many drivers usually don't like it because of a high penalty. So let's help drivers to know will they get a penalty for increasing speed or not. You're given `m x n` matrix `arr`, `arr[i][j]` is speed on current interval. You're also given the `limit` number, so if at least one of the checked speed is greater than a limit, the driver will get a penalty and you should print `Penalty!`, else print `No penalty for today.`

Input format

First two numbers - m and n - dimensions of a 2d array, where $1 \le m, n \le 100$
next `m x n` numbers are elements of the array $1 \le a[i][j] \le 100$. The last line contains single integer `limit` $(2 \le t \le 100)$.

Output format

If any element of the array is bigger than `limit` print `Penalty.` else print `No penalty for today.`.

Examples

Input

```
3 3
58 59 60
43 47 53
54 58 61
60
```

Output

```
Penalty!
```

Input

```
2 3
39 38 40
32 36 40
40
```

Output

```
No penalty for today.
```

Input

```
2 2
78 80
79 82
80
```

Output

```
Penalty!
```

Notes

In the first example, a[2][2] is 61, which is bigger than the limit number - 60, so the answer is `Penalty!`.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for C-186810. Powerful array

Time limit: 3 s

Real time limit: 6 s

Memory limit: 256M

Problem C: 186810. Powerful array

Array of numbers is called powerful if bitwise XOR of all its' numbers is some power of two. Determine if given array is powerful or not.

Input format

The first line contains an integer n ($1 \le n \le 10^6$), number of elements in the array. The next line contains n integers, elements of the array ($1 \le a_i \le 10^9$).

Output format

Print "YES" if the array is powerful, and "NO" otherwise.

Examples

Input

```
4
1 2 3 4
```

Output

```
YES
```

Input

```
4
1 3 10 4
```

Output

```
NO
```

Input

```
5
1 4 8 1 13
```

Output

```
YES
```

Notes

In the first example, the array is powerful, because 1 XOR 2 XOR 3 XOR 4 = 4 = 2^2.

In the second example, the array is NOT powerful, because 1 XOR 3 XOR 10 XOR 4 = 12 which is not a power of two.

In the third example, the array is powerful, because 1 XOR 4 XOR 8 XOR 1 XOR 13 = 1 = 2^0.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for D-189329. Nice joke.

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem D: 189329. Nice joke.

Daniil loves mathematics(nice joke), but now he wants Ivan and Ernur to also love mathematics and give a task. Daniil loves for some reason the topic of gcd(greatest common divisor, because it's only what he knows) and large numbers .
Help us find the largest node of these numbers.
Your task is to realize `function int gcd(int a, int b)`.

Input format

First line – integer n, where $2 \leq n \leq 100$.
Next line – Given an array a of n numbers $2 \leq a[i] \leq 100$.

Output format

Print integer – gcd.

Examples

Input

```
3
2 8 16
```

Output

```
8
```

Input

```
5
20 30 40 2 4
```

Output

```
20
```

Input

```
3
2 12 24
```

Output

```
12
```

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for E-188330. Dec to Hex.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem E: 188330. Dec to Hex.

Boris studies various number systems at school. He was given a homework assignment in which a decimal number is given as an input, he needs to convert the given decimal number to the equivalent hexadecimal number i.e. convert a number with a base value of 10 to a base value of 16. Help Boris write a program that solves this problem

Hexadecimal numbers use 16 values to represent a number. The numbers 0 through 9 are represented by the numbers 0-9, and 10-15 are represented by the characters A through F.

Input format

You are given integer N.

Output format

Print hex number of N.

Examples

Input

```
10
```

Output

```
A
```

Input

```
45
```

Output

```
2D
```

Input

```
2545
```

Output

```
9F1
```

Input

```
794
```

Output

```
31A
```

Notes

You need to write a function *dexToHex():*

void decToHex(int n)

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for F-196111. Boris the Chef.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem F: 196111. Boris the Chef.

Chef Boris is testing new dishes. He wants to find the most delicious dishes. But Boris is not only a chef, but also a programmer. Therefore, a dish is considered tasty if the sum of the ASCII codes of all letters in its name is more than 300. Write a program that will find tasty dishes.

Input format

You are given string S - name of the dish.

Output format

Print *It is tasty!* if the dish is tasty. Otherwise, print *Oh, no!*.

Examples

Input

```
OK
```

Output

```
Oh, no!
```

Input

```
sosisochki
```

Output

```
It is tasty!
```

Notes

Implement function `void isTasty(string s).`

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for G-140447. Chocolate chip cookies.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem G: 140447. Chocolate chip cookies.

Daulet loves chocolate chip cookies very much. He bought a whole box of cookies. He wondered how many chocolate crumbs were in the box? And what is the maximum number of chocolate chips in a box?

Input format

The first line of input contains single integer n — the number of cookies in the box. ($1 \le n \le 1000$).

The second line of input contains n space-separated numbers $a_1, a_2, \ldots, a_n$ — the amount of chocolate chips in each cookie. ($1 \le a_i \le 100$).

Output format

Output two space-separated integer — the total number and the maximum number of chocolate chips in the box.

Examples

Input

```
5
20 12 10 11 13
```

Output

```
66 20
```

Input

```
3
5 6 4
```

Output

```
15 6
```

Input

```
7
12 3 4 13 14 9 10
```

Output

```
65 14
```

Notes

Implement the function

```
void printTotalNumberAndTheMaximumNumberOfChips(int arr[], int n)
```

where arr - the amount of chocolate chips in each cookie and n — the number of cookies in the box.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for H-194191. Reverse string.

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem H: 194191. Reverse string.

Do you remember the recursion? To fix your knowledge about this topic you'll need to solve this problem. Given a string s, you need to reverse this string.

Input format

String s, where $(1 \leq |s| \leq 100)$ and contains latin letters and digits.

Output format

Print reversed version of this string.

Examples

Input

```
welcome
```

Output

```
emoclew
```

Input

```
Hello
```

Output

```
olleH
```

Input

```
weird1
```

Output

```
1driew
```

Notes

Try to Use recursion for this problem. At least function.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for I-187680. Sum.

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem I: 187680. Sum.

Given string S. Print a sum of the digit symbols.

Input format

First line contains string containing symbols. String length N $1 \leq N \leq 99$.

Output format

Print sum of digits.

Examples

Input

```
HeHeee1a4d0
```

Output

```
5
```

Input

```
80n80n[n1[W
```

Output

```
17
```

Notes

ASCII of the '0' is 48.

Submit a solution

Language: g++ - GCC 13.1 c++17

Submit a solution for J-149537. Sum of two numbers.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem J: 149537. Sum of two numbers.

You're given two arrays of numbers. For each number in the second array print "YES" if it can be viewed as sum of two elements with distinct indices from the first array, and "NO" otherwise.

Input format

The first line contains an integer n ($1 \le n \le 1000$), number of elements in the first array. The next line contains n integers, elements of the first array ($1 \le a_i \le 10^9$). Next line contains one integer m ($1 \le m \le 10^5$), number of elements in the second array. The last line contains m integers ($1 \le b_i \le 10^9$), elements for the second array.

Output format

For each element in the second array print in separate line "YES" if it can be viewed as sum of two elements with distinct indices from the first array, and "NO" otherwise.

Examples

Input

```
9
1 1 7 7 8 10 10 10 8
6
8 18 30 20 1 16
```

Output

```
YES
YES
NO
YES
NO
YES
```

Input

```
5
1 19 37 19 35
4
38 70 20 39
```

Output

```
YES
NO
YES
NO
```

Submit a solution

Language: g++ - GCC 13.1 c++17