Submit a solution for A-140258. Powerful hero.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem A: 140258. Powerful hero.

Daniil decided to make an “AAA” level game. One of the ideas is that hero can use both arms. Each hand has two parameters, the sum and the number of killed. Each enemy has an even or odd number. The left hand stores the sum of the even, and the count of the even. The right hand stores the sum of the odd, and the count of the odd. When the hero uses superpower, energy appears in each of his hands. Energy strength is the sum of hand multiplied by counter of the hand. Calculate the strength for each hand.

Input format

First line n (0<=n<=100) - amount of enemies. Second line n positive integers.(1<=n<=1000)

Output format

First line : Left hand magic power: number. Second line : Right hand magic power: number.

Examples

Input

```
0
```

Output

```
Left hand magic power: 0
Right hand magic power: 0
```

Input

```
3
55 12 33
```

Output

```
Left hand magic power: 12
Right hand magic power: 176
```

Input

```
5
14 67 90 70 96
```

Output

```
Left hand magic power: 1080
Right hand magic power: 67
```

Input

```
7
12 84 14 79 98 57 50
```

Output

```
Left hand magic power: 1290
Right hand magic power: 272
```

Input

```
4
34 85 45 76
```

Output

```
Left hand magic power: 220
Right hand magic power: 260
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

File: Выберите файл Файл не выбран

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
188	0:49:43	853	A	g++	OK	N/A	View	View

Submit a solution for B-193586. Art.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem B: 193586. Art.

One day Daniil decided to paint art. He had a canvas with a width w and height h. Since Daniil is not a humanist, he started with an easy one - to draw rectangle. He measured them by 4 coordinates x1, y1, x2, y2. (x1, y1) - coordinates of the upper left corner. Coordinates (x2, y2) - coordinates of the lower right corner. Find unpainded area of the canvas

Input format

First line integers w, h - width and height of the canvas ($0 \leq w, h \leq 100$)

Next line integer n ($1 \leq n \leq 10$)

Next n lines integers x1, y1, x2, y2 - coordinates of rectangle($0 \leq (x1, y1, x2, y2) \leq w, h$)

Output format

Integer - unpainded area of the canvas

Examples

Input

```
10 10
3
1 1 3 3
4 4 5 5
0 0 2 2
```

Output

```
92
```

Input

```
5 6
2
1 1 2 1
2 1 3 3
```

Output

```
28
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
198	0:51:37	753	B	g++	OK	N/A	View	View

Submit a solution for C-193529. Order.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem C: 193529. Order.

Daniil and Vanya decided to play a game. N cards were put in a row on the table. Daniil takes all cards with even number on it, and transfers them to the left edge of the row, without changing their order of sequence. And Vanya takes cards with odd numbers, and transfers them to the right without changing their sequence. Help automate this process, write your program!

Input format

First line integer n - amount of cards ($0 \leq n \leq 100$).

Next line n integers a_i - number on the i-th card ($0 \leq a_i \leq 100000$).

Output format

Sequence of numbers in the right order.

Examples

Input

```
5
1 2 3 4 5
```

Output

```
2 4 1 3 5
```

Input

```
10
345 1 2 3 4 4 3 2 1 345
```

Output

```
2 4 4 2 345 1 3 3 1 345
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
265	1:07:49	545	C	g++	OK	N/A	View	View

Submit a solution for D-143619. List modes.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem D: 143619. List modes.

You are given a list of integer numbers. Print its mode. Mode is the number that occurs most frequently in the list. If there is several modes, print them in descending order.

Input format

The first line of the input contains integer number n ($1 \le n \le 1000$) elements in the list. In the next line you are given $a_1, a_2, \ldots, a_n$ - elements of the list. ($1 \le a_i \le 1000$).

Output format

Print list's mode(-s) in descending order.

Examples

Input

```
10
1 2 2 9 8 9 6 6 7 6
```

Output

```
6
```

Input

```
7
1 9 4 8 2 8 1
```

Output

```
8 1
```

Input

```
6
9 20 64 7 3 92
```

Output

```
92 64 20 9 7 3
```

Input

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

Output

```
1
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

File Выберите файл Файл не выбран

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
352	1:33:47	597	D	g++	OK	N/A	View	View
349	1:32:23	590	D	g++	Wrong answer	5	View	View
343	1:29:18	551	D	g++	Wrong answer	3	View	View
340	1:27:54	551	D	g++	Wrong answer	2	View	View
291	1:14:07	442	D	g++	Wrong answer	2	View	View

Submit a solution for E-186812. Beautiful number.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem E: 186812. Beautiful number.

A number is called `beautiful` if its' first digit equals to sum of all other digits modulo 10. Determine if given number is beautiful or not.

Input format

The only line of input contains an integer x ($10 \le x \le 10^{18}$).

Output format

Print `YES` if the given number is beautiful, and `NO` otherwise.

Examples

Input

```
1123456
```

Output

```
YES
```

Input

```
790
```

Output

```
NO
```

Input

```
71111111111111111
```

Output

```
YES
```

Notes

In the first example, the number is beautiful, because $(1 + 2 + 3 + 4 + 5 + 6)$ MOD $10 = 1$ which is equal to first digit of the number.

In the second example, the number is NOT beautiful, because $(9 + 0)$ MOD $10 = 9 \neq 7$.

In the third example, the number is beautiful, because $(1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1)$ MOD $10 = 7$ which is equal to first digit of the number.

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
441	1:57:25	358	E	g++	OK	N/A	View	View

Submit a solution for F-187464. Perfect matrix or not?

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem F: 187464. Perfect matrix or not?

Check whether the given matrix is perfect or not and print the result. We call the matrix perfect if and only if it is symmetric over the main diagonal. The main diagonal is the one that goes from the upper left corner of the two-dimensional array to the lower right.

Input format

The first line is integer number n($1 \le n \le 100$) - the number of rows and columns in the array a($1 \le a_{i,j} \le 10^6$). Next, there are n lines, n numbers each, which are the elements of the array.

Output format

If the array is perfect print `Perfect.`, otherwise print `Not perfect.`

Examples

Input

```
3
0 1 2
1 5 3
2 3 4
```

Output

```
Perfect.
```

Input

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

Output

```
Not perfect.
```

Input

```
2
1 2
2 1
```

Output

```
Perfect.
```

Notes

In the first case, the matrix is perfect because it is symmetric about the main diagonal. The elements of the main diagonal: `0 5 4`.

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
465	2:02:29	589	F	g++	OK	N/A	View	View
460	2:01:09	585	F	g++	Wrong answer	1	View	View

Submit a solution for G-194546. Loop-square.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem G: 194546. Loop-square.

Asman decided to give a simple task to his students. All that is needed is to print the numbers from n to m which have integer square root.

Input format

You are given $n(1 <= n <= 1000), m(1 <= m <= 10000)$, direction(If 1, then output the sequence in the ascending order, if -1, then print the sequence in descending order.).

Output format

Sequence of numbers.

Examples

Input

```
1 100 1
```

Output

```
1 4 9 16 25 36 49 64 81 100
```

Input

```
1 100 -1
```

Output

```
100 81 64 49 36 25 16 9 4 1
```

Input

```
4 9 1
```

Output

```
4 9
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
739	3:21:40	544	G	g++	OK	N/A	View	View

Submit a solution for H-187378. Maximum product of two elements.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem H: 187378. Maximum product of two elements.

You are given an integer array. Print the maximum product of any two elements in the array.

Input format

The number of elements in the array - n($2 \leq n \leq 500$) and array a($1 \leq a_i \leq 100$).

Output format

Integer number - the maximum product of any two elements.

Examples

Input

```
4
5 2 1 7
```

Output

```
35
```

Input

```
7
9 4 7 4 8 9 10
```

Output

```
90
```

Input

```
2
4 8
```

Output

```
32
```

Notes

In the first example, the maximum product is 35 because if we multiply 5(0th) and 7(3rd) elements of the array we will get 35.

Submit a solution

Language: g++ - GNU C++ 7.4.0

File Выберите файл Файл не выбран

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
571	2:29:16	533	H	g++	OK	N/A	View	View

Submit a solution for I-195870. Puzzle.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem I: 195870. Puzzle.

Boris wants to play a puzzle. He has a square of size N x N, all the cells of which are filled with different numbers. He needs to find the maximum number in each row and fill that row with that number.

Input format

First line contains integer N, $(1 \leq N \leq 10^3)$ - size of square. Each next N line contains N different numbers, $(0 \leq square_i \leq 10^6)$.

Output format

Print new square.

Examples

Input

```
3
1 2 3
7 23 1
19 4 8
```

Output

```
3 3 3
23 23 23
19 19 19
```

Input

```
5
64 72 9 57 3
9 77 36 1 9
11 82 84 6 44
93 7 1 2 3
1 2 3 4 5
```

Output

```
72 72 72 72 72
77 77 77 77 77
84 84 84 84 84
93 93 93 93 93
5 5 5 5 5
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
649	2:51:37	828	I	g++	OK	N/A	View	View

Submit a solution for J-105365. Max and min digits of a number.

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

Problem J: 105365. Max and min digits of a number.

Given a number N. The task is to find the largest and the smallest digit of the number.

Input format

In single line given integer .

Output format

Print it's the largest and the smallest digit of the given number.

Examples

Input

```
274
```

Output

```
7 2
```

Input

```
840
```

Output

```
8 0
```

Submit a solution

Language: g++ - GNU C++ 7.4.0
File Выберите файл Файл не выбран
Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
38	0:13:55	426	J	g++	OK	N/A	View	View

Submit a solution for K-191358. Number of good students.

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem K: 191358. Number of good students.

As we all know, students often have many deadlines. A student is good if he did the assignment at a given time. You are given n - size of two arrays, first array a - start time, second b - end time, and integer t - query time. The i-th student started doing his homework at the time a[i] and finished it at time b[i]. You need to find the number of students who finished their assignment before the deadline(at time t) More formally, print the number of students where t lays in the interval [a[i], b[i]] inclusive.

Input format

The first line of the input contains an integer number n $(1 \leq n \leq 100)$. The second line of the input contains an integer array a. The third line of the input contains an integer array b. The fourth line contains integer t $(1 \leq t \leq 1000)$.

Output format

The output should contain the number of students, who passed the assignment at a given time.

Examples

Input

```
3
1 2 3
3 2 7
4
```

Output

```
1
```

Input

```
4
1 1 1 1
1 3 2 4
7
```

Output

```
0
```

Input

```
6
8 6 3 1 5 7
1 3 5 7 9 8
5
```

Output

```
3
```

Notes

In the first example, a = [1, 2, 3], b = [3, 2, 7], t = 4, and the answer is 1 because 4 lays only between a[2] and b[2], which means, only in one interval.

Submit a solution

Language: g++ - GNU C++ 7.4.0

File Выберите файл Файл не выбран

Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
35	0:13:14	468	K	g++	OK	N/A	View	View
34	0:12:47	770	K	g++	Wrong answer	1	View	View
15	0:05:44	577	K	g++	Wrong answer	4	View	View
13	0:04:42	578	K	g++	Wrong answer	3	View	View
11	0:03:46	574	K	g++	Wrong answer	4	View	View

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

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem L: 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 $1 \leq m, n \leq 100$
next `m x n` numbers are elements of the array $1 \leq a[i][j] \leq 100$. The last line contains single integer `limit` $(2 \leq t \leq 100)$.

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++ - GNU C++ 7.4.0

File: Выберите файл Файл не выбран

Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
9	0:03:35	770	L	g++	OK	N/A	View	View
6	0:02:43	767	L	g++	Wrong answer	5	View	View
4	0:02:07	767	L	g++	Wrong answer	1	View	View
3	0:01:29	754	L	g++	Wrong answer	1	View	View

Submit a solution for M-187101. Doubled pair

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

Problem M: 187101. Doubled pair

A pair of numbers is called doubled if there are exists an integer n, such that:

$$a * 2^n = b,$$

where a and b are the numbers from pair. Note that n must lie in the range $[-60; 60]$.

Input format

The only line of input contains a pair of integers, a and b ($1 \le a, b \le 2^{60}$).

Output format

If the given pair of numbers is doubled print "YES" and the integer n, otherwise just print "NO".

Examples

Input

```
2 32
```

Output

```
YES 4
```

Input

```
640 10
```

Output

```
YES -6
```

Input

```
1152921504606846976 1
```

Output

```
YES -60
```

Input

```
12 98
```

Output

```
NO
```

Input

```
100500 100500
```

Output

```
YES 0
```

Notes

In the first example $a * 2^4 = b$, so n is 4.

In the second example $a * 2^{-6} = b$, so n is -6.

In the third example $a * 2^{-60} = b$, so n is -60.

In the fourth example there is no such integer n that $a * 2^n = b$. So the answer is "NO".

In the last example $a * 2^0 = b$, so n is 0.

Submit a solution

Language: g++ - GNU C++ 7.4.0
File Выберите файл Файл не выбран
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Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
717	3:14:16	900	M	g++	OK	N/A	View	View
714	3:13:40	899	M	g++	Wrong answer	5	View	View
78	0:22:15	929	M	g++	Time-limit exceeded	3	View	View

Submit a solution for N-186813. Fully symmetric array

Time limit: 3 s

Real time limit: 6 s

Memory limit: 256M

Problem N: 186813. Fully symmetric array

Array of numbers is called fully symmetric if its' first half equals to reversed second part (with numbers reversed too). Determine if given array is fully symmetric or not.

Input format

The first line contains an even integer n ($2 \le n \le 10^6$), 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 fully symmetric, and "NO" otherwise.

Examples

Input

```
8
92 24 19 1 1 910 42 29
```

Output

```
YES
```

Input

```
6
1 2 3 6 2 11
```

Output

```
NO
```

Input

```
6
1 1 1 1000 100 10
```

Output

```
YES
```

Notes

In the first example, the array is fully symmetric, because if we reverse its' second part we will get $[92, 24, 019, 1]$ which is equal to the first part of the array. Note that leading zeros are not important, so $019 = 19$.

In the second example, the array is NOT fully symmetric, because its' first part is not equal to the reversed second one.

In the third example, the array is fully symmetric, because if we reverse its' second part we will get $[01, 001, 0001]$ which is equal to the first part of the array.

Submit a solution

Language: g++ - GNU C++ 7.4.0

File: Выберите файл Файл не выбран

Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
819	3:56:53	440	N	g++	OK	N/A	View	View
816	3:55:22	465	N	g++	Compilation error	N/A	View	View
85	0:23:24	551	N	g++	Wrong answer	1	View	View
55	0:17:31	547	N	g++	Wrong answer	1	View	View

Submit a solution for O-188278. Boris's grades

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem O: 188278. Boris's grades

The last bell rang and Boris realized that the holidays were beginning! Finally, he received his grades diary. However, in order to make happy his mother, he needs to know his average mark in each subject. Unfortunately, the teacher forgot to do this ... Help Boriska find out his grades!

Input format

In the first line you are given integer N - number of subjects, M - number of grades for each subject. $1 <= N, M <= 200$. The next N lines contain grades X for each subject. $1 <= X <= 200$.

Output format

Print the average grade for each subject on one line.

Examples

Input

```
5 4
1 2 3 4
1 2 3 4
2 3 4 5
2 2 2 2
5 5 4 5
```

Output

```
2 2 3 2 4
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

File Выберите файл Файл не выбран

Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
136	0:37:47	456	O	g++	OK	N/A	View	View