The 2020 Asia Jinan Regional Contest

Warm-up

December 26, 2020

Problem List

A	2020
B	Four Xor
C	GPA

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Problem A. 2020

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

2020 is a special integer, it's formed of two same integers (20 and 20).

We call a number is a good number, if and only if it can be formed of two same integers(without leading zero).

For example: 2020, 11, 19991999 are good numbers, but 303, 1122, 1221 are not.

Now you need to count the number of good numbers in $[1, N]$

Input

The first line has one single integer N

$1 \le N \le 10^{18}$

Output

Output the answer

Examples

standard input	standard output
34	3
111111	111
777776	776
123413454357678	9999999

Problem B. Four Xor

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

There is a sequence $A_{1...n}$, you need to answer whether there are 4 integers x, y, z, w satisfying $1 \le x < y < z < w \le n$ and $A_x \oplus A_y \oplus A_z \oplus A_w = 0$

The input guarantees that $\forall i \neq j, A_i \neq A_j$

Note: $x \oplus y$ means the exclusive or of x and y $(x\ xor\ y)$

Input

The first line contains one single integer n.

The second line contains n integers $A_{1...n}$.

The input guarantees that $4 \le n \le 10^5$, $0 \le A_i \le 10^5$ and $\forall i \neq j, A_i \neq A_j$.

Output

Output "Yes"if there are 4 integers satisfying the conditions, otherwise output "No".

Examples

standard input	standard output
5 1 2 3 4 5	Yes
5 1 2 4 8 16	No
5 1 3 4 8 9	No

Problem C. GPA

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

In this term, Alice took n courses. Now, she has finished all final exams, and she will get her grades in the following n days.

On the i-th day, Alice will know her grade of the ith course, denoted as A_i. If A_i is strictly less than the average grade of the first $i - 1$ courses, Alice will be sad on that day.

Now Bob hacks into the school's database. Bob can choose a set S of courses (S can be empty), and then for each course i in S, change Alice's grade from A_i to B_i.

Bob wants to minimize the number of days that Alice will be sad. Now you need to help him to decide which courses' grades he should modify.

Note: Alice is always happy on the first day.

Input

The first line contains one single integer n.

Then n lines follow. The i-th line contains 2 integers A_i, B_i.

The input guarantees that $1 \le n \le 4000$, $0 \le A_i, B_i \le 400$.

Output

Output the minimum number of the days that Alice will be sad.

Example

standard input	standard output
4 1 2 2 3 1 2 1 1	1