# Pride

time limit per test

2 seconds

memory limit per test

256 megabytes

You have an array *a* with length *n*, you can perform operations. Each operation is like this: choose two **adjacent** elements from *a*, say *x*and *y*, and replace one of them with *gcd*(*x*, *y*), where *gcd* denotes the [greatest common divisor](https://en.wikipedia.org/wiki/Greatest_common_divisor).

What is the minimum number of operations you need to make all of the elements equal to 1?

**Input**

The first line of the input contains one integer *n* (1 ≤ *n* ≤ 2000) — the number of elements in the array.

The second line contains *n* space separated integers *a*1, *a*2, ..., *an* (1 ≤ *ai* ≤ 109) — the elements of the array.

**Output**

Print -1, if it is impossible to turn all numbers to 1. Otherwise, print the minimum number of operations needed to make all numbers equal to 1.

**Examples**

**input**

**Copy**

5  
2 2 3 4 6

**output**

**Copy**

5

**input**

**Copy**

4  
2 4 6 8

**output**

**Copy**

-1

**input**

**Copy**

3  
2 6 9

**output**

**Copy**

4

**Note**

In the first sample you can turn all numbers to 1 using the following 5 moves:

* [2, 2, 3, 4, 6].
* [2, 1, 3, 4, 6]
* [2, 1, 3, 1, 6]
* [2, 1, 1, 1, 6]
* [1, 1, 1, 1, 6]
* [1, 1, 1, 1, 1]

We can prove that in this case it is not possible to make all numbers one using less than 5 moves.

# Mike and gcd problem

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2 seconds

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Mike has a sequence *A* = [*a*1, *a*2, ..., *an*] of length *n*. He considers the sequence *B* = [*b*1, *b*2, ..., *bn*] beautiful if the *gcd* of all its elements is bigger than 1, i.e. http://codeforces.com/predownloaded/95/64/9564b5d5792d464213a733bc62e19d424d991193.png.

Mike wants to change his sequence in order to make it beautiful. In one move he can choose an index *i* (1 ≤ *i* < *n*), delete numbers *ai*, *ai*+ 1 and put numbers *ai* - *ai*+ 1, *ai* + *ai*+ 1 in their place instead, in this order. He wants perform as few operations as possible. Find the minimal number of operations to make sequence *A* beautiful if it's possible, or tell him that it is impossible to do so.

http://codeforces.com/predownloaded/ee/ed/eeed959e241062c1b7376e31c0fb68ca0c4afd9e.png is the biggest non-negative number *d* such that *d* divides *bi* for every *i* (1 ≤ *i* ≤ *n*).

**Input**

The first line contains a single integer *n* (2 ≤ *n* ≤ 100 000) — length of sequence *A*.

The second line contains *n* space-separated integers *a*1, *a*2, ..., *an* (1 ≤ *ai* ≤ 109) — elements of sequence *A*.

**Output**

Output on the first line "YES" (without quotes) if it is possible to make sequence *A* beautiful by performing operations described above, and "NO" (without quotes) otherwise.

If the answer was "YES", output the minimal number of moves needed to make sequence *A* beautiful.

**Examples**

**input**

**Copy**

2  
1 1

**output**

**Copy**

YES  
1

**input**

**Copy**

3  
6 2 4

**output**

**Copy**

YES  
0

**input**

**Copy**

2  
1 3

**output**

**Copy**

YES  
1

**Note**

In the first example you can simply make one move to obtain sequence [0, 2] with http://codeforces.com/predownloaded/0d/8f/0d8fe7f48b2ba24b6221de4bf019824531792087.png.

In the second example the *gcd* of the sequence is already greater than 1.