

## C. Prairie Partition

time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

It can be shown that any positive integer  $x$  can be uniquely represented as  $x = 1 + 2 + 4 + \dots + 2^{k-1} + r$ , where  $k$  and  $r$  are integers,  $k \geq 0$ ,  $0 < r \leq 2^k$ . Let's call that representation prairie partition of  $x$ .

For example, the prairie partitions of 12, 17, 7 and 1 are:

$$\begin{aligned}12 &= 1 + 2 + 4 + 5, \\17 &= 1 + 2 + 4 + 8 + 2, \\7 &= 1 + 2 + 4, \\1 &= 1.\end{aligned}$$

Alice took a sequence of positive integers (possibly with repeating elements), replaced every element with the sequence of summands in its prairie partition, arranged the resulting numbers in non-decreasing order and gave them to Borys. Now Borys wonders how many elements Alice's original sequence could contain. Find all possible options!

### Input

The first line contains a single integer  $n$  ( $1 \leq n \leq 10^5$ ) — the number of numbers given from Alice to Borys.

The second line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $1 \leq a_i \leq 10^{12}$ ;  $a_1 \leq a_2 \leq \dots \leq a_n$ ) — the numbers given from Alice to Borys.

### Output

Output, **in increasing order**, all possible values of  $m$  such that there exists a sequence of positive integers of length  $m$  such that if you replace every element with the summands in its prairie partition and arrange the resulting numbers in non-decreasing order, you will get the sequence given in the input.

If there are no such values of  $m$ , output a single integer  $-1$ .

### Examples

<b>input</b>
8 1 1 2 2 3 4 5 8
<b>output</b>
2
<b>input</b>
6 1 1 1 2 2 2
<b>output</b>
2 3
<b>input</b>
5 1 2 4 4 4
<b>output</b>
-1

**Note**

In the first example, Alice could get the input sequence from  $[6, 20]$  as the original sequence.

In the second example, Alice's original sequence could be either  $[4, 5]$  or  $[3, 3, 3]$ .