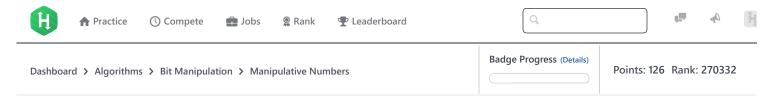
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# Manipulative Numbers **■**





Suppose that A is a list of n numbers  $\{A_1, A_2, A_3, \ldots, A_n\}$  and  $B = \{B_1, B_2, B_3, \ldots, B_n\}$  is a permutation of these numbers, we say B is K-Manipulative if and only if:

 $M(B) = minimum(B_1 \oplus B_2, B_2 \oplus B_3, B_3 \oplus B_4, \dots, B_{n-1} \oplus B_n, B_n \oplus B_1)$  is not less than  $2^K$ , where  $\oplus$  represents the XOR operator.

You are given  $m{A}$ . Find the largest  $m{K}$  such that there exists a  $\emph{K-manipulative}$  permutation  $m{B}$ .

### Input

The first line is an integer N. The second line contains N space separated integers -  $A_1$   $A_2$   $\ldots$   $A_n$ .

### Output

The largest possible K, or -1 if there is no solution.

#### **Constraints:**

- 1 < n <= 100
- $0 \le A_i \le 10^9$ , where  $i \in [1, n]$

# Sample Input #00

3 13 3 10

## Sample Output #00

2

# Explanation

Here the list A is  $\{13,3,10\}$ . One possible permutation  $B=\{10,3,13\}$ . Here  $M(B)=minimum\{B_1\oplus B_2,B_2\oplus B_3,B_3\oplus B_1\}=minimum\{10\oplus 3,3\oplus 13,13\oplus 10\}=minimum\{9,14,7\}=7$ .

So there exists a permutation B of A such that M(B) is not less than  $A = 2^2$ . However there does not exist any permutation B of A such that M(B) is not less than  $B = 2^3$ . So the maximum possible value of B is B.

## Sample Input #01

4 1 2 3 4

## Sample Output #01

1

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                                                                                             Java 7
                                                                                                                              \Diamond
 1 ▼ import java.io.*;
 2 import java.util.*;
 3
   import java.text.*;
 4 import java.math.*;
 5
    import java.util.regex.*;
 7 ▼ public class Solution {
 8
 9 ▼
         public static void main(String[] args) {
             /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
10 ▼
11
12
   }
                                                                                                                      Line: 1 Col: 1
                      ☐ Test against custom input
                                                                                                          Run Code
                                                                                                                       Submit Code
1 Upload Code as File
```

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