

B. Shortest Cycle

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given n integer numbers a_1, a_2, \dots, a_n . Consider graph on n nodes, in which nodes i, j ($i \neq j$) are connected if and only if, $a_i \text{ AND } a_j \neq 0$, where AND denotes the [bitwise AND operation](#).

Find the length of the shortest cycle in this graph or determine that it doesn't have cycles at all.

Input

The first line contains one integer n ($1 \leq n \leq 10^5$) — number of numbers.

The second line contains n integer numbers a_1, a_2, \dots, a_n ($0 \leq a_i \leq 10^{18}$).

Output

If the graph doesn't have any cycles, output -1 . Else output the length of the shortest cycle.

Examples

input	Copy
4 3 6 28 9	
output	Copy
4	
input	Copy
5 5 12 9 16 48	
output	Copy
3	
input	Copy
4 1 2 4 8	
output	Copy
-1	

Note

In the first example, the shortest cycle is (9, 3, 6, 28).

In the second example, the shortest cycle is (5, 12, 9).

The graph has no cycles in the third example.

Codeforces Round #580 (Div. 1)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest](#)

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

[Clone Contest](#)

→ Submit?

Language: GNU G++11 5.1.0

Choose file: [选择文件](#) 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

[Submit](#)

→ Problem tags

[bitmasks](#) [brute force](#) [graphs](#)
[shortest paths](#) *1900

No tag edit access

→ Contest materials

- [Announcement #1 \(en\)](#) ☐
- [Announcement #2 \(ru\)](#) ☐
- [Tutorial \(en\)](#) ☐

[Codeforces](#) (c) Copyright 2010-2019 Mike Mirzayanov
The only programming contests Web 2.0 platform
Server time: Aug/19/2019 11:25:38^{UTC+8} (e1).
Desktop version, switch to [mobile version](#).
[Privacy Policy](#).

Supported by



ITMO UNIVERSITY