C. Arpa's loud Owf and Mehrdad's evil plan

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

As you have noticed, there are lovely girls in Arpa's land.

People in Arpa's land are numbered from 1 to n. Everyone has exactly one crush, i-th person's crush is person with the number $crush_i$.

Someday Arpa shouted *Owf* loudly from the top of the palace and a funny game started in Arpa's land. The rules are as follows.

The game consists of rounds. Assume person x wants to start a round, he calls $crush_x$ and says: "`Oww...wwf`" (the letter `w` is repeated t times) and cuts off the phone immediately. If $t > 1$ then $crush_x$ calls $crush_{crush_x}$ and says: "`Oww...wwf`" (the letter `w` is repeated t - 1 times) and cuts off the phone immediately. The round continues until some person receives an "`Owf`" ($t = 1$). This person is called the *Joon-Joon* of the round. There can't be two rounds at the same time.

Mehrdad has an evil plan to make the game more funny, he wants to find smallest t ($t \geq 1$) such that for each person x, if x starts some round and y becomes the Joon-Joon of the round, then by starting from y, x would become the Joon-Joon of the round. Find such t for Mehrdad if it's possible.

Some strange fact in Arpa's land is that someone can be himself's crush (i.e. $crush_i = i$).

Input

The first line of input contains integer n ($1 \leq n \leq 100$) — the number of people in Arpa's land.

The second line contains n integers, i-th of them is $crush_i$ ($1 \leq crush_i \leq n$) — the number of i-th person's crush.

Output

If there is no t satisfying the condition, print `-1`. Otherwise print such smallest t.

Examples

input
4 2 3 1 4
output
3

input
4 4 4 4 4
output
-1

input
4 2 1 4 3
output
1

Note

In the first sample suppose $t = 3$.

If the first person starts some round:

The first person calls the second person and says "`Owwwf`", then the second person calls the third person and says "`Owwf`", then the third person calls the first person and says "`Owf`", so the first person becomes Joon-Joon of the round. So the condition is satisfied if x is 1.

The process is similar for the second and the third person.

If the fourth person starts some round:

The fourth person calls himself and says "`Owwwf`", then he calls himself again and says "`Owwf`", then he calls himself for another time and says "`Owf`", so the fourth person becomes Joon-Joon of the round. So the condition is satisfied when x is 4.

In the last example if the first person starts a round, then the second person becomes the Joon-Joon, and vice versa.