

Problem G. Galois

Input file: galois.in
Output file: galois.out
Time limit: 1 second
Memory limit: 512 megabytes

Third time Evariste is attempting the entrance examination for the École Polytechnique. He managed to solve all the tasks very quickly, but the examiner accuses him of lack of explanations. He tries to make Evariste fail and gives him the following task: for the given permutation p of size N , count the number of **even** permutations q of size N such that $p_{q_i} = q_{p_i}$ for all i from 1 to N . As this number can be very large, the examiner wants to know it modulo $10^9 + 7$.

A permutation is said to be *even* if it contains an even number of inversions. An *inversion* of a permutation p is a pair of indices (i, j) such that $i < j$ and $p_i > p_j$.

Unfortunately for the examiner, who has no idea about the correct answer, Galois managed to solve the problem in only one second. You should help examiner and tell him the answer, or young Evariste will be denied again.

Input

The first line of the input contains a single integer N , which denotes the length of the permutation ($1 \leq N \leq 500\,000$).

The second line describes the permutation p itself and contains N integers p_i ($1 \leq p_i \leq N$, $p_i \neq p_j$ for all $i \neq j$).

Output

Count the number of even permutations q that satisfy the condition $p_{q_i} = q_{p_i}$, and output it modulo $10^9 + 7$.

Examples

galois.in	galois.out
3 3 1 2	3
3 2 1 3	1

Note

In the first example there are three appropriate permutations: $(1, 2, 3)$, $(2, 3, 1)$, $(3, 1, 2)$. All of them are even.

In the second example there are two appropriate permutations: $(1, 2, 3)$, $(2, 1, 3)$. However, only first of these permutations is even.