Duel

SEASON 10 – SIXTH ROUND

Last Sunday Koko was watching the N-th season of the „Farm: The scheme does not end“ and he was impressed by the scoring of the battles which took place. Because he loves the reality show very much, he hopes that the farmers will play all battles including the last one. Formally, the duel between the two farmers consists of N battles, the i-th of which gives P_i points (P is a permutation of the numbers from 1 to N). When one of the two players wins a battle, the points which it gives are added to his result and if the battle ends with a draw – each of the two players gets half of the points for it. When one of the two players has collected more than a half of all points, he wins the duel and the remaining battles are not played.

Koko knows what the scoring distribution is, but he does not know which player will win each battle or whether it will end with a draw. He noticed that the total number of possible ways in which the duel could unfold is 3^N. Now he is interested how many of them are favourable – i. e. the winner will not be determined before the last battle, it will be played and after it there will be a winner. Write a program which satisfies Koko's curiosity.

Input

The first line of the input file `duel.in` consists of one integer N. The second line consists of N numbers, which represent the permutation P.

Output

On the only line of the output file `duel.out` print a single number, equal to the count of all favourable possibilities in which the duel could unfold. Because this number could be quite large print only the remainder modulo $1\,000\,000\,007$.

Constraints

$1 < N \leq 300$

Example

Input	Output
3 3 2 1	6

Explanation

Let's note a draw with D, a victory for the first player with W, and a loss for the first player with L. The favourable ways in which the duel could unfold are DDW, DDL, WLD, WLW, LWL, LWD. Note that in case of DDD, WLL or LWW the last battle will be played but after it there will not be a distinct winner.