Ordered Permutations

Time limit: *1000 ms*
Memory limit: *256 MB*

Consider a permutation P of length N. You are given a list of $N-1$ restrictions R on permutation P. The i-th restriction states that $P_i < P_{i+1}$ if R_i is of the first type and $P_i > P_{i+1}$ if R_i is of the second type. Your task is to calculate the number of permutations P that meet all $N-1$ restrictions. Since this number may be large, you should output it modulo 10^9+7.

Standard input

The first line contains one number N. The second line contains a string R of length $N-1$ representing the restrictions. The i-th character is either $<$ or $>$ meaning that R_i is of the first or the second type, respectively.

Standard output

Output one line containing a single integer, the number of permutations P that meet all $N-1$ restrictions, modulo 10^9+7.

Constraints and notes

- $1 \leq N \leq 8000$

Input	Output
5 <<<>	4
4 <><	5
5 <><>	16

In the first example, the possible permutations P are
$(1, 2, 3, 5, 4), (1, 2, 4, 5, 3), (1, 3, 4, 5, 2), (2, 3, 4, 5, 1).$