

Self Checkout

Input file: **standard input**
Output file: **standard output**
Time limit: **2 seconds**
Memory limit: **1024 megabytes**

You are given a sequence S of length N , consisting of integers 1, 2, and 3. Determine the number of sequences A consisting of integers 1 and 2 such that the sequence T obtained after performing the following procedure matches S . Output the answer modulo 998244353. It can be proven that the number of such sequences A is finite.

- Start with an empty sequence T . Given a sequence A consisting of integers 1 and 2, perform the following process to obtain the sequence T :
 1. Set a variable $C = 0$.
 2. If A contains at least one 1, remove the first occurrence of 1 from A and add 1 to C .
 3. If A is not empty, remove the first element x of A and add x to C .
 4. Append C to the end of T .
 5. If A is empty, terminate the process. Otherwise, return to step 1.

Input

The input is given in the following format:

N $S_1 S_2 \dots S_N$

- All input values are integers.
- $1 \leq N \leq 10^6$
- $1 \leq S_i \leq 3$

Output

Output the number of sequences A that satisfy the conditions, modulo 998244353.

Examples

standard input	standard output
2 3 2	5
6 3 2 2 3 2 1	4
5 3 2 1 3 2	0

Note

In the first example, there are 5 possible sequences A that result in $T = (3, 2)$:

$A = (1, 2, 2), (2, 1, 2), (2, 2, 1), (2, 1, 1, 1), (1, 2, 1, 1)$.

For example, for $A = (2, 1, 1, 1)$, the process proceeds as follows:

- Remove the first occurrence of 1 in A , which is $A_2 = 1$. Now $A = (2, 1, 1)$ and $C = 1$.
- Remove the first element of A , which is $A_1 = 2$. Now $A = (1, 1)$ and $C = 3$.
- Append C to the end of T . Now $T = (3)$.
- Remove the first occurrence of 1 in A , which is $A_1 = 1$. Now $A = (1)$ and $C = 1$.
- Remove the first element of A , which is $A_1 = 1$. Now $A = ()$ and $C = 2$.
- Append C to the end of T . Now $T = (3, 2)$.