Problem E. Ego Eimi

Time limit: 1 second
Memory limit: 1024 mebibytes

You are given an array A of length N, consisting of non-negative integers.

You may perform the following operation any number of times, including zero.

- Choose two adjacent indices i and $i+1$ ($1 \le i < N$).
- One of the two chosen indices is selected uniformly at random, each with probability $\frac{1}{2}$.
- If index j is selected, decrease A_j by 1.

Before each operation, you may choose the pair of adjacent indices based on the results of all previous operations.

Your goal is to make every element of A equal to 0.

Assuming that you choose the adjacent pair optimally at every step, find the maximum possible probability of making all elements of A equal to 0.

Input

The first line contains an integer N — the length of the array.

The second line contains N integers $A_1, A_2, \ldots, A_N$.

Output

Print the maximum possible probability modulo 998 244 353.

More precisely, let $\frac{p}{q}$ be this probability, where q is not divisible by 998 244 353. Print $p \cdot q^{-1} \bmod 998\,244\,353$, where q^{-1} denotes the multiplicative inverse of q modulo 998 244 353.

It can be proven that the maximum possible probability is a rational number.

Constraints

- $2 \le N \le 2 \cdot 10^5$
- $0 \le A_i$
- $\sum_{i=1}^{N} A_i \le 2 \cdot 10^5$

Examples

standard input	standard output
3 1 1 1	623902721
2 10 0	997269505
5 3 1 4 1 5	993979393
5 2 1 7 1 8	997993025
6 1 2 3 4 5 6	908289873
5 0 0 0 0 0	1

Note

In the first example, one optimal strategy is to choose indices 2 and 3 first.

If index 2 is selected, the array becomes $[1, 0, 1]$, from which the maximum probability of success is $\frac{1}{4}$.

If index 3 is selected, the array becomes $[1, 1, 0]$, from which the maximum probability of success is $\frac{1}{2}$.

Therefore, the maximum probability is $\frac{1}{2} \cdot \frac{1}{4} + \frac{1}{2} \cdot \frac{1}{2} = \frac{3}{8}$.

In the second example, the only possible pair of adjacent indices is 1 and 2. To make all elements equal to 0, index 1 must be selected in all 10 operations. Therefore, the maximum probability is $\frac{1}{2^{10}} = \frac{1}{1024}$.

In the third example, the maximum probability is $\frac{35}{8192}$.

In the fourth example, the maximum probability is $\frac{33}{131072}$.