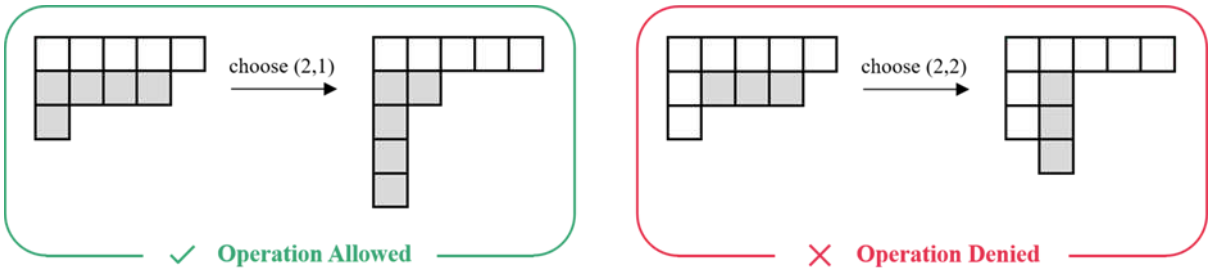
Problem H. Cute Young Diagram Counting

A *Young diagram* is a finite set of cells, arranged in left-aligned rows, with the row lengths in non-increasing order. It can be uniquely represented by an unordered integer partition $\lambda = (\lambda_1, \lambda_2, \ldots, \lambda_r)$ satisfying $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_r \geq 1$, where r corresponds to the number of rows of the Young diagram, and λ_i corresponds to the number of cells in the i-th row for $i = 1, 2, \ldots, r$.

The *conjugate* of a Young diagram λ is another Young diagram obtained by transposing rows and columns, represented by the conjugate partition λ^T. More specifically, if λ has $c = \lambda_1$ columns, then $\lambda^T = (\mu_1, \mu_2, \ldots, \mu_c)$ where $\mu_j = |\{\, i : \lambda_i \geq j \,\}|$ for $j = 1, 2, \ldots, c$.

For a cell at the i-th row and the j-th column that belongs to λ, let the *subdiagram* anchored at (i, j) be the set of all cells (x, y) of λ with $x \geq i$ and $y \geq j$. It is easy to see that, this set is itself a Young diagram when viewed with (i, j) as its top-left corner.

Define the *cuteness* of a Young diagram λ as the number of distinct Young diagrams that can be obtained from λ by performing the following operation any number (possibly zero) of times: choose any cell (i, j) of the current Young diagram, take the subdiagram anchored at (i, j), and replace it with its conjugate anchored at the same position. The operation is allowed if and only if the overall set of cells still forms a valid Young diagram; otherwise the operation is denied and undone, as illustrated below.



You are given a non-increasing sequence of positive integers $a_1, a_2, \ldots, a_n$. For each $i = 1, 2, \ldots, n$, compute the cuteness of the Young diagram $\lambda^{(i)}$, modulo 998 244 353, where $\lambda^{(i)} = (a_1, a_2, \ldots, a_i)$.

Input

The first line contains a single integer n ($1 \leq n \leq 10^6$), denoting the length of the given sequence.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq n$). It is guaranteed that $a_1 \geq a_2 \geq \cdots \geq a_n$.

Output

Output n integers separated by spaces, where the i-th integer represents the cuteness of the Young diagram $\lambda^{(i)}$, modulo 998 244 353.

Example

standard input	standard output
3 3 2 1	2 3 1

Note

For the sample case:

- The distinct Young diagrams that can be obtained from $\lambda^{(1)}$ are (3) and $(1, 1, 1)$;
- The distinct Young diagrams that can be obtained from $\lambda^{(2)}$ are $(3, 2)$, $(3, 1, 1)$, and $(2, 2, 1)$;
- The only Young diagram that can be obtained from $\lambda^{(3)}$ is $(3, 2, 1)$ itself.

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