Problem J. Guess The Sequence 2

Little K has a **random** permutation $p_1, p_2, \ldots, p_n$ of $1 \sim n$. And he is going to give his friend Little Cyan Fish a quiz.

Little K can choose a set of subsegments of the permutation and provide the maximum value of each subsegment to Little Cyan Fish. Formally, he can choose a set $\{(l_1, r_1), (l_2, r_2), \ldots, (l_k, r_k)\}$ where $1 \le l_i \le r_i \le n$ for every $1 \le i \le k$, and Little Cyan Fish will receive k tuples $(l_1, r_1, m_1), (l_2, r_2, m_2), \cdots, (l_k, r_k, m_k)$ where $m_i = \max_{j=l_i}^{r_i} p_j$, indicating the maximum value of each subsegment Little K chooses.

Little Cyan Fish has to guess what Little K's permutation is. Since Little K is Little Cyan Fish's best friend, he needs to make it possible to correctly guess the permutation based on the information he provided. Therefore, there should be only one permutation satisfying the information Little K provides.

Little K is curious about the number of different sets of subsegments that can be provided to Little Cyan Fish, so that he can uniquely determine the permutation. Unfortunately, Little K cannot figure this problem out himself, so he asks you for help. Since the answer is really big, print it modulo 998 244 353.

Input

The first line of the input contains a single integer n ($1 \le n \le 5 \times 10^5$).

The next line of the input contains n integers $p_1, p_2, \cdots, p_n$ ($1 \le p_i \le n$, $p_1, p_2, \cdots, p_n$ is a permutation of $1 \sim n$). **It is guaranteed that the permutation is uniformly randomly chosen from all permutations of length n.**

Output

Output a single line contains a single integer, indicating the answer modulo 998 244 353.

Examples

standard input	standard output
2 1 2	6
4 1 4 2 3	532