Problem M. Crystal Castle

tarjen is the guardian of the Crystal Castle. The castle's corridor is inlaid with a row of n magic crystals, where the i-th crystal has color number a_i. Adjacent crystals of the same color resonate and form a **color segment** — a maximal run of consecutive identical colors. For example, the color sequence $[1, 1, 2, 2, 1]$ has 3 color segments: $[1, 1]$, $[2, 2]$, and $[1]$.

Every day, travelers come and ask q questions. Each question specifies an interval $[l, r]$: if we take out these crystals, randomly shuffle them (choosing uniformly at random among all permutations with repetition), what is the expected number of color segments?

Output the answer modulo 998244353. That is, if the answer is an irreducible fraction $\frac{p}{q}$, output $p \cdot q^{-1} \bmod 998244353$. It can be shown that $q^{-1} \bmod 998244353$ always exists under the constraints of this problem.

Input

The first line contains an integer T $(1 \le T \le 100\,000)$ — the number of test cases.

For each test case:

The first line contains two integers n, q $(1 \le n, q \le 100\,000)$ — the number of crystals and the number of queries.

The second line contains n integers $a_1, a_2, \ldots, a_n$ $(1 \le a_i \le n)$ — the color of each crystal.

The next q lines each contain two integers l, r $(1 \le l \le r \le n)$ — the endpoints of the query interval.

The sum of n over all test cases does not exceed 100 000, and the sum of q does not exceed 100 000.

Output

For each query, output a single integer — the expected number of color segments modulo 998244353.

Examples

standard input	standard output
1 4 2 1 1 2 2 1 2 1 4	1 3
1 10 5 3 5 3 3 6 4 8 2 3 5 6 9 1 8 8 10 4 9 7 7	4 748683272 3 665496241 1

Note

For the first sample:

The first query: the crystal colors taken out are $[1, 1]$. There is only one permutation, and the number of color segments is 1.

The second query: the crystal colors taken out are $[1, 1, 2, 2]$. The 6 permutations have color segment counts $2, 4, 3, 3, 4, 2$, and the expected value is $\frac{18}{6} = 3$.