

Problem H. RMQ Similar Sequence

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 256 mebibytes

Chiaki has a sequence $A = \{a_1, a_2, \dots, a_n\}$. Let $\mathbf{RMQ}(A, l, r)$ be the minimum i ($l \leq i \leq r$) such that a_i is the maximum value in a_l, a_{l+1}, \dots, a_r .

Two sequences A and B are called *RMQ Similar*, if they have the same length n and for every $1 \leq l \leq r \leq n$, $\mathbf{RMQ}(A, l, r) = \mathbf{RMQ}(B, l, r)$.

For a given the sequence $A = \{a_1, a_2, \dots, a_n\}$, define the weight of a sequence $B = \{b_1, b_2, \dots, b_n\}$ be $\sum_{i=1}^n b_i$ (i.e. the sum of all elements in B) if sequence B and sequence A are RMQ Similar, or 0 otherwise.

If each element of B is a real number chosen independently and uniformly at random between 0 and 1, find the expected weight of B .

Input

There are multiple test cases. The first line of input contains an integer T , indicating the number of test cases. For each test case:

The first line contains an integer n ($1 \leq n \leq 10^6$) – the length of the sequence.

The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq n$) denoting the sequence.

It is guaranteed that the sum of all n does not exceed 3×10^6 .

Output

For each test case, output the answer as a value of a rational number modulo $10^9 + 7$.

Formally, it is guaranteed that under given constraints the probability is always a rational number $\frac{p}{q}$ (p and q are integer and coprime, q is positive), such that q is not divisible by $10^9 + 7$. Output such integer a between 0 and $10^9 + 6$ that $p - aq$ is divisible by $10^9 + 7$.

Example

standard input	standard output
3	250000002
3	500000004
1 2 3	125000001
3	
1 2 1	
5	
1 2 3 2 1	