

MEX-imum Beauty

Input file: **standard input**
Output file: **standard output**
Time limit: 1.5 seconds
Memory limit: 256 megabytes

For an array b of length m , define the beauty of b as the MEX* of the sequence of prefix maximums of b . Formally,

$$\text{MEX}(\{\max(b_1), \max(b_1, b_2), \max(b_1, b_2, b_3), \dots, \max(b_1, b_2, \dots, b_m)\})$$

Given an array a of n integers, please compute the sum of the beauty of all non-empty subarrays[†] of a .

* The MEX of a set of integers is the smallest non-negative integer that does not appear in the set. For example, $\text{MEX}(\{1, 2, 3\}) = 0$, $\text{MEX}(\{2, 9, 0, 1\}) = 3$.

† A sequence b is a subarray of a sequence a if b can be obtained from a by deletion of several (possibly, zero or all) elements from the beginning and several (possibly, zero or all) elements from the end.

Input

The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of test cases.

The first line of each test case contains an integer n ($1 \leq n \leq 10^6$).

The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i \leq n$).

It is guaranteed that the sum of n over all test cases does not exceed 10^6 .

Output

For each test case, output a single integer — the sum of the beauty of all non-empty subarrays of a .

Example

standard input	standard output
4	14
6	15
3 0 1 0 2 4	6
5	3
0 1 2 3 4	
6	
2 0 3 5 1 0	
3	
0 3 1	

Note

In the first test case, the sum of the beauty of all non-empty subarrays is 14. In particular, the subarray from index 2 to 5 is $[0, 1, 0, 2]$. Its beauty is $\text{MEX}(\{\max(0), \max(0, 1), \max(0, 1, 0), \max(0, 1, 0, 2)\}) = \text{MEX}(\{0, 1, 1, 2\}) = 3$.