Problem J. Counting Is Fun

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

Let B be an array of length M consisting of positive integers.

In one operation, you may choose a non-empty subsequence[†] of indices

$$1 \le i_1 < i_2 < \cdots < i_k \le M$$

such that the values

$$B_{i_1}, B_{i_2}, \ldots, B_{i_k}$$

are pairwise distinct, and then decrease each chosen value by 1.

Define the **score** of B, denoted by score(B), as the minimum number of operations needed to make every element of B equal to 0.

You are given an array A of length N.

Find the sum of score over all the non-empty subsequences of A.

Since the value might be large, output it modulo 998 244 353.

[†] A sequence C is called a subsequence of a sequence D if it can be obtained from D by deleting several elements, possibly none or all of them, without changing the order of the remaining elements.

Input

The input is given in the following format:

T
N
$A_1\ A_2\ \cdots\ A_N$
$\vdots$

- All input values are integers.
- $1 \le T \le 10^5$
- $1 \le N \le 5000$
- $1 \le A_i \le 10^9$
- It is guaranteed that the sum of N^2 over all test cases does not exceed 5000^2.

Output

For each test case, output a single integer — the sum of score over all the non-empty subsequences of A, modulo 998 244 353.

Examples

standard input	standard output
3 1 5 3 1 1 3 4 2 2 2 2	5 16 47

Note

Test case 1: The only non-empty subsequence is [5], with score 5. Therefore, the answer is 5.

Test case 2: The non-empty subsequences of $[1, 1, 3]$ are:

- two subsequences equal to [1], each with score 1,
- [3], with score 3,
- $[1, 1]$, with score 2,
- two subsequences equal to $[1, 3]$, each with score 3,
- $[1, 1, 3]$, with score 3.

So, the total sum is 16.