Sort

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	512 megabytes

Given a permutation p of length n.

Each operation randomly chooses an integer i with equal probability ($1 \leq i \leq n$), and then sorts the prefix interval $[1, i]$ and the suffix interval $[i+1, n]$ of the permutation p in ascending order, respectively. In particular, when $i = n$, the suffix interval is empty, which is equivalent to sorting the entire permutation.

You need to find the expected number of operations required until the final permutation becomes completely sorted in ascending order (that is, $p_j = j$).

The answer should be taken modulo 998244353.

Input

This problem contains multiple test cases.

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

For each test case:

- The first line contains an integer n ($1 \leq n \leq 500$), the length of the permutation.
- The second line contains n integers $p_1, p_2, \cdots, p_n$ ($1 \leq p_j \leq n$), representing the given permutation p. It is guaranteed that the given sequence is a permutation of $1 \sim n$.

It is guaranteed that the sum of n over all test cases does not exceed 2000.

Output

For each test case, output one line containing an integer, the expected number of operations modulo 998244353.

Example

standard input	standard output
3 3 3 1 2 2 2 1 5 3 2 5 1 4	748683267 2 670695427