

## Problem D. Merging Maximum

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

You are given a permutation  $P$  of  $\{1, 2, \dots, N\}$ .

That is,  $P$  is an array of length  $N$  containing every integer from 1 to  $N$  exactly once.

You can perform the following operation on it:

- Choose an index  $i$  ( $1 < i < |P|$ ).
- Set  $P_i = \max(P_{i-1}, P_i, P_{i+1})$ .
- Delete  $P_{i-1}$  and  $P_{i+1}$  from  $P$ . The remaining elements are then re-indexed to start from 1.

Each such operation reduces the length of  $P$  by 2. In particular, if the length of  $P$  is 1 or 2, then this operation cannot be applied.

Find the number of distinct arrays that can be reached by performing this operation zero or more times starting from  $P$ .

Since this value might be large, you only need to find it modulo 998 244 353.

### Input

The input is given in the following format:

$T$
$N$
$P_1 P_2 \dots P_N$
$\vdots$

- All input values are integers.
- $1 \leq T \leq 10^5$
- $1 \leq N \leq 5000$
- $1 \leq P_i \leq N$
- $P_i \neq P_j$  for all  $i \neq j$ .
- 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 number of distinct arrays that can be reached by performing the operation zero or more times on  $P$ , modulo 998 244 353.

## Examples

standard input	standard output
5	1
2	2
2 1	5
3	55
2 1 3	365
5	
3 1 4 5 2	
10	
1 2 3 4 5 6 7 8 9 10	
15	
5 7 6 12 2 13 10 1 11 4 3 9 14 15 8	

## Note

**Test case 1:** No operations can be performed.

**Test case 2:** There are two possibilities:

- Perform no operations. The final array is [2, 1, 3].
- Perform one operation with  $i = 2$ . The final array is [3].

These are the only reachable arrays.