Excellent Splitting

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Little H has a permutation P, and he wants to split P into sequence A and sequence B.

Specifically, Little H will take several elements from P in order and place them into sequence A, while the remaining elements will form another sequence B in order.

For example, if $P = [1, 2, 3, 4, 5]$, he can split P into $A = [1, 3, 5], B = [2, 4]$.

He is very fond of increasing subsequences and decreasing subsequences. Define $f(A)$ as the length of the longest increasing subsequence of A, and $g(B)$ as the length of the longest decreasing subsequence of B. You need to tell him the maximum value of $f(A) + g(B)$.

Input

The first line contains a positive integer T ($1 \leq T \leq 2 \cdot 10^5$), indicating the number of test cases.

For each test case, the first line contains an integer n ($1 \leq n \leq 2 \times 10^5$), representing the length of the permutation P.

The second line contains n integers $P_1, P_2, \ldots, P_n$ ($1 \leq P_i \leq n$), ensuring that P_i is a permutation.

The sum of n across all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output a single line containing an integer, representing the maximum value of $f(A) + g(B)$.

Example

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