

## Problem J. Reverse Inversion

*tarjen* has a permutation  $p$  of length  $n$ . You may perform at most one operation: choose two integers  $l$  and  $r$  ( $1 \leq l \leq r \leq n$ ) and reverse the subarray  $p_l, p_{l+1}, \dots, p_r$ .

What is the maximum number of inversions in the permutation after the operation?

An *inversion* is a pair of indices  $(i, j)$  satisfying  $1 \leq i < j \leq n$  and  $p_i > p_j$ .

### Input

The first line contains an integer  $T$  ( $1 \leq T \leq 10^5$ ) — the number of test cases.

Each test case:

- The first line contains an integer  $n$  ( $1 \leq n \leq 8000$ ) — the length of the permutation.
- The second line contains  $n$  integers  $p_1, p_2, \dots, p_n$  ( $1 \leq p_i \leq n$ ) — the permutation.

The sum of  $n$  over all test cases does not exceed 8000.

### Output

For each test case, output a single integer — the maximum number of inversions.

### Example

standard input	standard output
3	2
3	10
2 1 3	10
5	
5 4 3 2 1	
6	
3 5 1 4 2 6	

### Note

Reversing the interval  $[1, 3]$  yields  $[3, 1, 2]$ , which has 2 inversions:  $(1, 2)$  and  $(1, 3)$ .