A. Anti Monotonicity Revisited

Time Limit: 6 sec

Description

Given a permutation of (1,2,3, ..., n), find the length of the longest Anti-Monotonous subsequence of this permutation, i.e. a subsequence A[0]...A[k] that satisfies:

A[0] > A[1] < A[2] > A[3] < ... A[k]

Also,

1) Output the number of ways of generating this length modula 10000007.
2) Output the mean value of the lengths of the longest Anti-Monotonous subsequence over all permutations of (1,2,3, ... , n)

The Input

For each test case, the first line contains the number n (0 <= n <= 100000) followed by n integers representing the permutation.

The Output

For each test case, output a triple of integer followed by a new line --- the length of the longest subsequence, the number of the ways module 10000007, and the mean value of the lengths over all permutations rounded to integer.

Sample Input	Sample Output
10 1 9 2 3 4 10 5 7 8 6 5 2 4 1 3 5	6 9 7 3 5 4

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