11295   Anti Monotonicity Revisited

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

$$A[0] > A[1] < A[2] > A[3] < \ldots A[k]$$

 Also,

1. Output the number of ways of generating this lenght modula 10000007.

2. Output the mean value of the lenghts of the longest Anti-Monotonous subsequence over all permutations of $(1, 2, 3, \ldots, n)$. Round to integer.

Input

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

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

```
10
1 9 2 3 4 10 5 7 8 6
5
2 4 1 3 5
```

Sample Output

```
6 9 7
3 5 4
```