Problem D. Sum of Medians

Time limit 1000 ms
Memory limit 256MB

Problem Description

You are given an array A with n positive integers $a_1, a_2, a_3, ..., a_n$, and the teacher allowed you to do the following operation.

In the operation, you can split the array A into several subarrays. Every integer of array A must belong to exactly one subarray.

After you split the array, you are curious about the minimum sum of medians of all subarrays among all possible ways.

(Don't ask me why you are curious about it.)

Therefore, your task is to find the minimum sum of medians of all subarrays among all possible ways.

An array B is a subarray of an array A if B can be obtained from a by deletion of several (possibly, zero or all) elements from the beginning and several (possibly, zero or all) elements from the end. In particular, an array is a subarray of itself.

In this problem, the median of an array $a_1, a_2, ..., a_n$ is the $n/2 + n\%2$ element after it sort in non-decreasing order.

Input format

The first line contain a single integer $n(1 \leq n \leq 200000)$, the length of array A.
The second line contain n positive integers $a_1, a_2, a_3., .., a_n(1 \leq a_i \leq 10^9)$.

Output format

Output a single integer, which means the minimum sum of medians of all subarrays among all possible ways.

Subtask score

Subtask	Score	Additional Constraints
1	100	No constraints

Sample

Sample Input 1

```
1
1
```

Sample Output 1

```
1
```

Sample Input 2

```
5
4 3 5 1 2
```

Sample Output 2

```
3
```

Notes

In first testcase 1, the array A only contain an single integer so the answer is 1.
In second testcase, [4,3],[5,1,2] is a possible way to split, but the sum of their medians is $3 + 2 = 5$.
It can be prove that 3 is the the minimum sum of median of all subarrays among all possible way.