Lily's Homework

HackerRank

Whenever George asks Lily to hang out, she's busy doing homework. George wants to help her finish it faster, but he's in over his head! Can you help George understand Lily's homework so she can hang out with him?

Consider an array of n distinct integers, $arr = [a[0], a[1], \ldots, a[n-1]]$. George can swap any two elements of the array any number of times. An array is *beautiful* if the sum of $|arr[i] - arr[i-1]|$ among $0 < i < n$ is minimal.

Given the array arr, determine and return the minimum number of swaps that should be performed in order to make the array *beautiful*.

Example

$arr = [7, 15, 12, 3]$

One minimal array is $[3, 7, 12, 15]$. To get there, George performed the following swaps:

```
Swap      Result
      [7, 15, 12, 3]
3 7   [3, 15, 12, 7]
7 15  [3, 7, 12, 15]
```

It took 2 swaps to make the array beautiful. This is minimal among the choices of beautiful arrays possible.

Function Description

Complete the *lilysHomework* function in the editor below.

lilysHomework has the following parameter(s):

- *int arr[n]:* an integer array

Returns

- *int:* the minimum number of swaps required

Input Format

The first line contains a single integer, n, the number of elements in arr. The second line contains n space-separated integers, $arr[i]$.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq arr[i] \leq 2 \times 10^9$

Sample Input

```
STDIN       Function
-----       --------
4           arr[]size n = 4
2 5 3 1     arr = [2, 5, 3, 1]
```

Sample Output

```
2
```

Explanation

Define $arr' = [1, 2, 3, 5]$ to be the beautiful reordering of arr. The sum of the absolute values of differences between its adjacent elements is minimal among all permutations and only two swaps (1 with 2 and then 2 with 5) were performed.