

Problem 1887: Reduction Operations to Make the Array Elements Equal

Problem Information

Difficulty: Medium

Acceptance Rate: 72.40%

Paid Only: No

Tags: Array, Sorting

Problem Description

Given an integer array `nums`, your goal is to make all elements in `nums` equal. To complete one operation, follow these steps:

1. Find the **largest** value in `nums`. Let its index be `i` (**0-indexed**) and its value be `largest`. If there are multiple elements with the largest value, pick the smallest `i`.
2. Find the **next largest** value in `nums` **strictly smaller** than `largest`. Let its value be `nextLargest`.
3. Reduce `nums[i]` to `nextLargest`.

Return _the number of operations to make all elements in_ `nums` _equal_.

Example 1:

Input: nums = [5,1,3] **Output:** 3 **Explanation:** It takes 3 operations to make all elements in nums equal:
1. largest = 5 at index 0. nextLargest = 3. Reduce nums[0] to 3.
nums = [3,1,3].
2. largest = 3 at index 0. nextLargest = 1. Reduce nums[0] to 1. nums = [1,1,3].
3. largest = 3 at index 2. nextLargest = 1. Reduce nums[2] to 1. nums = [1,1,1].

Example 2:

Input: nums = [1,1,1] **Output:** 0 **Explanation:** All elements in nums are already equal.

Example 3:

****Input:**** nums = [1,1,2,2,3] ****Output:**** 4 ****Explanation:**** It takes 4 operations to make all elements in nums equal: 1. largest = 3 at index 4. nextLargest = 2. Reduce nums[4] to 2. nums = [1,1,2,2,_2_]. 2. largest = 2 at index 2. nextLargest = 1. Reduce nums[2] to 1. nums = [1,1,_1_,2,2]. 3. largest = 2 at index 3. nextLargest = 1. Reduce nums[3] to 1. nums = [1,1,1,_1_,2]. 4. largest = 2 at index 4. nextLargest = 1. Reduce nums[4] to 1. nums = [1,1,1,1,_1_].

****Constraints:****

* `1 <= nums.length <= 5 * 10⁴` * `1 <= nums[i] <= 5 * 10⁴`

Code Snippets

C++:

```
class Solution {  
public:  
    int reductionOperations(vector<int>& nums) {  
  
    }  
};
```

Java:

```
class Solution {  
public int reductionOperations(int[] nums) {  
  
}  
}
```

Python3:

```
class Solution:  
    def reductionOperations(self, nums: List[int]) -> int:
```