Problem 1675: Minimize Deviation in Array

Problem Information

Difficulty: Hard
Acceptance Rate: 53.94%
Paid Only: No
Tags: Array, Greedy, Heap (Priority Queue), Ordered Set

Problem Description

You are given an array `nums` of `n` positive integers.

You can perform two types of operations on any element of the array any number of times:

* If the element is **even** , **divide** it by `2`. * For example, if the array is `[1,2,3,4]`, then you can do this operation on the last element, and the array will be `[1,2,3,_2_].` * If the element is **odd** , **multiply** it by `2`. * For example, if the array is `[1,2,3,4]`, then you can do this operation on the first element, and the array will be `[_2_ ,2,3,4].`

The **deviation** of the array is the **maximum difference** between any two elements in the array.

Return _the**minimum deviation** the array can have after performing some number of operations._

Example 1:

Input: nums = [1,2,3,4] **Output:** 1 **Explanation:** You can transform the array to [1,2,3,_2_], then to [_2_ ,2,3,2], then the deviation will be 3 - 2 = 1.

Example 2:

Input: nums = [4,1,5,20,3] **Output:** 3 **Explanation:** You can transform the array after two operations to [4,_2_ ,5,_5_ ,3], then the deviation will be 5 - 2 = 3.

Example 3:

Input: nums = [2,10,8] **Output:** 3

Constraints:

* `n == nums.length` * `2 <= n <= 5 * 104` * `1 <= nums[i] <= 109`

Code Snippets

C++:

```
class Solution {
public:
int minimumDeviation(vector<int>& nums) {

}
};
```

Java:

```
class Solution {
public int minimumDeviation(int[] nums) {

}
}
```

Python3:

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