

Problem 3505: Minimum Operations to Make Elements Within K Subarrays Equal

Problem Information

Difficulty: Hard

Acceptance Rate: 26.67%

Paid Only: No

Tags: Array, Hash Table, Math, Dynamic Programming, Sliding Window, Heap (Priority Queue)

Problem Description

You are given an integer array `nums` and two integers, `x` and `k`. You can perform the following operation any number of times (**including zero**):

- * Increase or decrease any element of `nums` by 1.

Return the **minimum** number of operations needed to have **at least** `k` non-overlapping subarrays of size **exactly** `x` in `nums`, where all elements within each subarray are equal.

Example 1:

Input: `nums = [5,-2,1,3,7,3,6,4,-1]`, `x = 3`, `k = 2`

Output: 8

Explanation:

- * Use 3 operations to add 3 to `nums[1]` and use 2 operations to subtract 2 from `nums[3]`. The resulting array is `[5, 1, 1, 1, 7, 3, 6, 4, -1]`.
- * Use 1 operation to add 1 to `nums[5]` and use 2 operations to subtract 2 from `nums[6]`. The resulting array is `[5, 1, 1, 1, 7, 4, 4, 4, -1]`.
- * Now, all elements within each subarray `[1, 1, 1]` (from indices 1 to 3) and `[4, 4, 4]` (from indices 5 to 7) are equal. Since 8 total operations were used, 8 is the output.

Example 2:

****Input:**** nums = [9,-2,-2,-2,1,5], x = 2, k = 2

****Output:**** 3

****Explanation:****

* Use 3 operations to subtract 3 from `nums[4]`. The resulting array is `[9, -2, -2, -2, -2, 5]`. *
Now, all elements within each subarray `[-2, -2]` (from indices 1 to 2) and `[-2, -2]` (from indices 3 to 4) are equal. Since 3 operations were used, 3 is the output.

****Constraints:****

* `2 <= nums.length <= 105` * `-106 <= nums[i] <= 106` * `2 <= x <= nums.length` * `1 <= k <= 15` * `2 <= k * x <= nums.length`

Code Snippets

C++:

```
class Solution {
public:
    long long minOperations(vector<int>& nums, int x, int k) {

    }
};
```

Java:

```
class Solution {
    public long minOperations(int[] nums, int x, int k) {

    }
}
```

Python3:

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