



C++ Assignments | Sliding Window | Week 12

1. Given an array of integers `arr` and two integers `k` and `threshold`, return *the number of sub-arrays of size `k` and average greater than or equal to `threshold`*. [Leetcode 1343]

Example 1:

Input: `arr = [2,2,2,2,5,5,8]`, `k = 3`, `threshold = 4`

Output: 3

Explanation: Sub-arrays `[2,5,5]`, `[5,5,5]` and `[5,5,8]` have averages 4, 5 and 6 respectively. All other sub-arrays of size 3 have averages less than 4 (the threshold).

Example 2:

Input: `arr = [11,13,17,23,29,31,7,5,2,3]`, `k = 3`, `threshold = 5`

Output: 6

Explanation: The first 6 sub-arrays of size 3 have averages greater than 5. Note that averages are not integers.

2. The **score** of an array is defined as the **product** of its sum and its length.
 - For example, the score of `[1, 2, 3, 4, 5]` is $(1 + 2 + 3 + 4 + 5) * 5 = 75$.
Given a positive integer array `nums` and an integer `k`, return *the number of non-empty subarrays of `nums` whose score is strictly less than `k`*. [Leetcode 2302]

A **subarray** is a contiguous sequence of elements within an array.

Example 1:

Input: `nums = [2,1,4,3,5]`, `k = 10`

Output: 6

Explanation:

The 6 subarrays having scores less than 10 are:

- `[2]` with score $2 * 1 = 2$.
- `[1]` with score $1 * 1 = 1$.
- `[4]` with score $4 * 1 = 4$.
- `[3]` with score $3 * 1 = 3$.
- `[5]` with score $5 * 1 = 5$.
- `[2,1]` with score $(2 + 1) * 2 = 6$.

Note that subarrays such as [1,4] and [4,3,5] are not considered because their scores are 10 and 36 respectively, while we need scores strictly less than 10.

Example 2:

Input: nums = [1,1,1], k = 5

Output: 5

Explanation:

Every subarray except [1,1,1] has a score less than 5.

[1,1,1] has a score $(1 + 1 + 1) * 3 = 9$, which is greater than 5.

Thus, there are 5 subarrays having scores less than 5.

3. Given an array of integers `nums` and an integer `k`. A continuous subarray is called **nice** if there are `k` odd numbers on it.

Return *the number of nice sub-arrays*.

[Leetcode 1248]

Example 1:

Input: nums = [1,1,2,1,1], k = 3

Output: 2

Explanation: The only sub-arrays with 3 odd numbers are [1,1,2,1] and [1,2,1,1].

Example 2:

Input: nums = [2,4,6], k = 1

Output: 0

Explanation: There is no odd numbers in the array.

Example 3:

Input: nums = [2,2,2,1,2,2,1,2,2,2], k = 2

Output: 16

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain 😊.
