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 = [2,2,2,2,5,5,5,8], 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😀.
