2023-08-05 - Handout – Sliding Window

Q1. Minimum Size Subarray Sum

Link: https://leetcode.com/problems/minimum-size-subarray-sum/description/

Given an array of positive integers **nums** and a positive integer **target**, return the minimal length of a *subarray* whose sum is greater than or equal to target. If there is no such subarray, return 0 instead.
Example1
Input: target = 7, nums = [2, 3, 1, 2, 4, 3]
Output: 2
Explanation: The subarray [4, 3] has the minimal length under the problem constraint.

Example2:
Input: target = 4, nums = [1, 4, 4]
Output: 1
Example3:
Input: target = 11, nums = [1, 1, 1, 1, 1, 1, 1, 1, 1]
Output: 0

Constraints:
$1 <= target <= 10^5$; $1 <= nums.length <= 10^5$; $1 <= nums[i] <= 10^4$

Q2. Longest Repeating Character Replacement

Link: https://leetcode.com/problems/longest-repeating-character-replacement/

You are given a string **s** and an integer **k**. You can choose any character of the string and change it to any other uppercase English character. You can perform this operation at ***most k*** times. Return the *length of the longest substring containing the same letter you can get after performing the above operations.*

Example1
Input: s = “ABAB”, k = 2
Output: 4
Explanation: Replace the two ‘A’s with two ‘B’s or vice versa.

Example2
Input: s = “AABABBA”, k = 1
Output: 4
Explanation: Replace the one ‘A’ in the middle with ‘B’ and form “AABBBA”. The substring “BBBB” has the longest repeating letters, which is 4. There may exist other ways to achieve this answer too.
Constraints:
$1 <= s.length <= 10^5$
s consists of only uppercase English letters

Q3. Find all Anagrams in a string.

Link: https://leetcode.com/problems/find-all-anagrams-in-a-string/description/

Given two strings **s** and **p**, return an array of all the start indices of p's anagrams in **s.** You may return the answer in **any order.** An Anagram is a word or phrase formed by rearranging the letters of a different word or phrase, typically using all the original letters exactly once.

Example1
Input: s = "cbaebabacd", p = "abc"
Output: [0, 6]
Explanation: The substring with start index = 0 is "cba", which is an anagram of "abc"
The substring with start index = 6 is "bac", which is an anagram of "abc"

Example2
Input: s = "abab", p = "ab"
Output: [0, 1, 2]
Explanation:
The substring with start index = 0 is "ab", which is an anagram of "ab".
The substring with start index = 1 is "ba", which is an anagram of "ab"
The substring with start index = is "ab", which is an anagram of "ab".

Constraints:
1 <= s.length , p.length <= $3 * 10^4$

Q4. Shortest Subarray with Sum at Least K

Link: https://leetcode.com/problems/shortest-subarray-with-sum-at-least-k/description/

Given an integer array **nums** and an integer **k**, return the *length of the shortest non-empty **subarray** of nums with a sum of at least **k***. If there is no such **subarray**, return -1. A subarray is a **contiguous** part of an array.

Example1
Input: nums = [1], k = 1
Output: 1

Example2
Input: nums = [2, -1, 2], k = 3
Output: -1

Example1
Input: nums = [84, -37, 32, 40, 95], k = 167
Output: 3

Constraints:
1 <= nums.length <= 10^5