438. Find All Anagrams in a String

Given a string **s** and a **non-empty** string **p**, find all the start indices of **p**'s anagrams in **s**.

Strings consists of lowercase English letters only and the length of both strings **s** and **p** will not be larger than 20,100.

The order of output does not matter.

Example 1:

```
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".
```

Example 2:

```
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 = 2 is "ab", which is an anagram of "ab".
```

找到string中的易位构词(anagram)所有起始index

Hash table, String, fixed size sliding window

1. two int[26] arrays to store the occurence of char
2. iterate [0, plength] to store the frequence of first plength size characters
3. then iterate [1, slength-plength] with a fixed plength window to scare the rest string
4. decrease the frequence out of the current window and increase the frequence new inside the current window
5. if `Arrays.equals(mapS, mapP)` two hashmaps are the same that means there is a match of anagram

567. Permutation in String

Given two strings **s1** and **s2**, write a function to return true if **s2** contains the permutation of **s1**. In other words, one of the first string's permutations is the **substring** of the second string.

Example 1:

```
Input: s1 = "ab" s2 = "eidbaooo"
Output: True
Explanation: s2 contains one permutation of s1 ("ba").
```

Example 2:

```
Input:s1= "ab" s2 = "eidboaoo"
Output: False
```

Constraints:

- The input strings only contain lower case letters.
- The length of both given strings is in range [1, 10,000].

大字符串是否包含小字符串的排列

Array, fixed size sliding window

same approach as 438

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643. Maximum Average Subarray I

Given an array consisting of `n` integers, find the contiguous subarray of given length `k` that has the maximum average value. And you need to output the maximum average value.

Example 1:

```
Input: [1,12,-5,-6,50,3], k = 4
Output: 12.75
Explanation: Maximum average is (12-5-6+50)/4 = 51/4 = 12.75
```

Note:

1. 1 <= k <= n <= 30,000.
2. Elements of the given array will be in the range [-10,000, 10,000].

最大平均数的k长度子数组

fixed size sliding window

1. sum first k values as raw result
2. main a k size sliding window to iterate the array [1, length-k]
3. while iterating, delete the one out of the window, and add the one new inside the window to main a sum of k values.
