1358. Number of Substrings Containing All Three Characters

Medium | Topics | Companies | Hint

Given a string `s` consisting only of characters *a*, *b* and *c*.

Return the number of substrings containing **at least** one occurrence of all these characters *a*, *b* and *c*.

Example 1:

> **Input:** s = "abcabc"
> **Output:** 10
> **Explanation:** The substrings containing at least one occurrence of the characters *a*, *b* and *c* are "abc", "abca", "abcab", "abcabc", "bca", "bcab", "bcabc", "cab", "cabc" and "abc" (**again**).

Example 2:

> **Input:** s = "aaacb"
> **Output:** 3
> **Explanation:** The substrings containing at least one occurrence of the characters *a*, *b* and *c* are "aaacb", "aacb" and "acb".

Example 3:

> **Input:** s = "abc"
> **Output:** 1

Constraints:

- `3 <= s.length <= 5 x 10^4`
- `s` only consists of *a*, *b* or *c* characters.

Approach 1:

```cpp
class Solution {
public:
    int numberOfSubstrings(string s) {
        int ans=0;
        unordered_map<char,int> m={{'a',0},{'b',0},{'c',0}};
        int l=0,r=0;
        int n=s.length();
        while(r<n){
            if(r<n) m[s[r]]++;;

            if(m['a'] >0 && m['b'] >0 && m['c'] >0){
                while(m['a'] >0 && m['b'] >0 && m['c'] >0){
                    ans=ans+n-r;
                    m[s[l]]--;
                    l++;
                }
            }

            r++;
        }

        return ans;
    }
};
```

T(n): O(n+n)

S(n): O(3)