3104. Find Longest Self-Contained Substring Premium

Hard Topics Companies Hint

Given a string `s`, your task is to find the length of the **longest self-contained** substring of `s`.

A substring `t` of a string `s` is called **self-contained** if `t != s` and for every character in `t`, it doesn't exist in the *rest* of `s`.

Return the length of the *longest self-contained* substring of `s` if it exists, otherwise, return -1.

Example 1:

> **Input:** `s = "abba"`
>
> **Output:** 2
>
> **Explanation:**
> Let's check the substring `"bb"`. You can see that no other `"b"` is outside of this substring. Hence the answer is 2.

Example 2:

> **Input:** `s = "abab"`
>
> **Output:** -1
>
> **Explanation:**
> Every substring we choose does not satisfy the described property (there is some character which is inside and outside of that substring). So the answer would be -1.

Example 3:

> **Input:** `s = "abacd"`
>
> **Output:** 4
>
> **Explanation:**
> Let's check the substring `"abac"`. There is only one character outside of this substring and that is `"d"`. There is no `"d"` inside the chosen substring, so it satisfies the condition and the answer is 4.

Constraints:

- `2 <= s.length <= 5 * 10^4`
- `s` consists only of lowercase English letters.

Seen this question in a real interview before? 1/5

Yes No

Accepted 555 | Submissions 1K | Acceptance Rate 55.0%

Topics

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Hint 1

Fix the start index of the substring.

Hint 2

For some fixed index `start`, let's try to find some index `end` such that this substring satisfies the property and also `end` is as maximum as possible.

Hint 3

Write some recursive function `shrink(start, end)` that gives a substring. If the substring is valid, then return `end`. Otherwise, it reduces < `end` to reach some valid `end`.

Hint 4

For some `shrink(start, end)`, if the substring is not valid, it means there is some character that is both inside and outside of the substring. Now try to reduce `end` such that it does not contain that character anymore.

Hint 5

If you implement the `shrink(start, end)` function optimally, you'll achieve `O(n * 26 * 26)` by using partial sum.

Discussion (0)