Problem 2430: Maximum Deletions on a String

Problem Information

Difficulty: Hard
Acceptance Rate: 35.37%
Paid Only: No
Tags: String, Dynamic Programming, Rolling Hash, String Matching, Hash Function

Problem Description

You are given a string `s` consisting of only lowercase English letters. In one operation, you can:

* Delete **the entire string** `s`, or * Delete the **first** `i` letters of `s` if the first `i` letters of `s` are **equal** to the following `i` letters in `s`, for any `i` in the range `1 <= i <= s.length / 2`.

For example, if `s = "ababc"`, then in one operation, you could delete the first two letters of `s` to get `"abc"`, since the first two letters of `s` and the following two letters of `s` are both equal to `"ab"`.

Return _the**maximum** number of operations needed to delete all of _`s`.

Example 1:

Input: s = "abcabcdabc" **Output:** 2 **Explanation:** - Delete the first 3 letters ("abc") since the next 3 letters are equal. Now, s = "abcdabc". - Delete all the letters. We used 2 operations so return 2. It can be proven that 2 is the maximum number of operations needed. Note that in the second operation we cannot delete "abc" again because the next occurrence of "abc" does not happen in the next 3 letters.

Example 2:

Input: s = "aaabaab" **Output:** 4 **Explanation:** - Delete the first letter ("a") since the next letter is equal. Now, s = "aabaab". - Delete the first 3 letters ("aab") since the next 3 letters are equal. Now, s = "aab". - Delete the first letter ("a") since the next letter is equal. Now, s = "ab". - Delete all the letters. We used 4 operations so return 4. It can be proven that

4 is the maximum number of operations needed.

Example 3:

Input: s = "aaaaa" **Output:** 5 **Explanation:** In each operation, we can delete the first letter of s.

Constraints:

* `1 <= s.length <= 4000` * `s` consists only of lowercase English letters.

Code Snippets

C++:

```cpp
class Solution {
public:
int deleteString(string s) {


}
};
```

Java:

```java
class Solution {
public int deleteString(String s) {


}
}
```

Python3:

```python
class Solution:
def deleteString(self, s: str) -> int:
```