

2510. Maximum Deletions on a String

Difficulty : Hard

<https://leetcode.com/problems/maximum-deletions-on-a-string>

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 $1 \leq i \leq s.length / 2$.

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: $s = "abcbcdabc"$

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:

- $1 \leq s.length \leq 4000$
- s consists only of lowercase English letters.