Problem 3441: Minimum Cost Good Caption

Problem Information

Difficulty: Hard
Acceptance Rate: 19.44%
Paid Only: No
Tags: String, Dynamic Programming

Problem Description

You are given a string `caption` of length `n`. A **good** caption is a string where **every** character appears in groups of **at least 3** consecutive occurrences.

For example:

* `"aaabbb"` and `"aaaaccc"` are **good** captions. * `"aabbb"` and `"ccccd"` are **not** good captions.

You can perform the following operation **any** number of times:

Choose an index `i` (where `0 <= i < n`) and change the character at that index to either:

* The character immediately **before** it in the alphabet (if `caption[i] != 'a'`). * The character immediately **after** it in the alphabet (if `caption[i] != 'z'`).

Your task is to convert the given `caption` into a **good** caption using the **minimum** number of operations, and return it. If there are **multiple** possible good captions, return the **lexicographically smallest** one among them. If it is **impossible** to create a good caption, return an empty string `""`.

Example 1:

Input: caption = "cdcd"

Output: "cccc"

Explanation:

It can be shown that the given caption cannot be transformed into a good caption with fewer than 2 operations. The possible good captions that can be created using exactly 2 operations are:

* `"dddd"`: Change `caption[0]` and `caption[2]` to their next character `'d'`. * `"cccc"`: Change `caption[1]` and `caption[3]` to their previous character `'c'`.

Since `"cccc"` is lexicographically smaller than `"dddd"`, return `"cccc"`.

Example 2:

Input: caption = "aca"

Output: "aaa"

Explanation:

It can be proven that the given caption requires at least 2 operations to be transformed into a good caption. The only good caption that can be obtained with exactly 2 operations is as follows:

* Operation 1: Change `caption[1]` to `'b'`. `caption = "aba"`. * Operation 2: Change `caption[1]` to `'a'`. `caption = "aaa"`.

Thus, return `"aaa"`.

Example 3:

Input: caption = "bc"

Output: ""

Explanation:

It can be shown that the given caption cannot be converted to a good caption by using any number of operations.

Constraints:

* `1 <= caption.length <= 5 * 104` * `caption` consists only of lowercase English letters.

Code Snippets

C++:

```
class Solution {
public:
string minCostGoodCaption(string caption) {

}
};
```

Java:

```
class Solution {
public String minCostGoodCaption(String caption) {

}
}
```

Python3:

```
class Solution:
def minCostGoodCaption(self, caption: str) -> str:
```