Problem 3529: Count Cells in Overlapping Horizontal and Vertical Substrings

Problem Information

Difficulty: Medium
Acceptance Rate: 26.15%
Paid Only: No
Tags: Array, String, Rolling Hash, String Matching, Matrix, Hash Function

Problem Description

You are given an `m x n` matrix `grid` consisting of characters and a string `pattern`.

A **horizontal substring** is a contiguous sequence of characters read from left to right. If the end of a row is reached before the substring is complete, it wraps to the first column of the next row and continues as needed. You do **not** wrap from the bottom row back to the top.

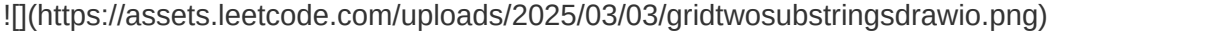
A **vertical substring** is a contiguous sequence of characters read from top to bottom. If the bottom of a column is reached before the substring is complete, it wraps to the first row of the next column and continues as needed. You do **not** wrap from the last column back to the first.

Count the number of cells in the matrix that satisfy the following condition:

* The cell must be part of **at least** one horizontal substring and **at least** one vertical substring, where **both** substrings are equal to the given `pattern`.

Return the count of these cells.

Example 1:



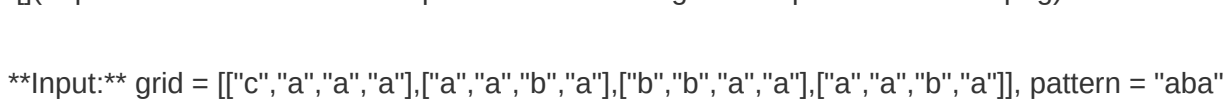
Input: grid = [["a","a","c","c"],["b","b","b","c"],["a","a","b","a"],["c","a","a","c"],["a","a","b","a"]], pattern = "abaca"

Output: 1

Explanation:

The pattern `"abaca"` appears once as a horizontal substring (colored blue) and once as a vertical substring (colored red), intersecting at one cell (colored purple).

Example 2:



Input: grid = [["c","a","a","a"],["a","a","b","a"],["b","b","a","a"],["a","a","b","a"]], pattern = "aba"

Output: 4

Explanation:

The cells colored above are all part of at least one horizontal and one vertical substring matching the pattern `"aba"`.

Example 3:

Input: grid = [["a"]], pattern = "a"

Output: 1

Constraints:

* `m == grid.length` * `n == grid[i].length` * `1 <= m, n <= 1000` * `1 <= m * n <= 105` * `1 <= pattern.length <= m * n` * `grid` and `pattern` consist of only lowercase English letters.

Code Snippets

C++:

```
class Solution {
public:
int countCells(vector<vector<char>>& grid, string pattern) {
```

```
}
};
```

Java:

```
class Solution {
public int countCells(char[][] grid, String pattern) {

}
}
```

Python3:

```
class Solution:
def countCells(self, grid: List[List[str]], pattern: str) -> int:
```