Problem 2147: Number of Ways to Divide a Long Corridor

Problem Information

Difficulty: Hard
Acceptance Rate: 48.72%
Paid Only: No
Tags: Math, String, Dynamic Programming

Problem Description

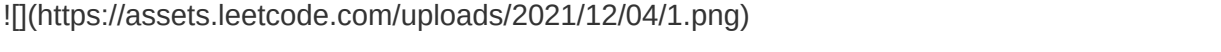
Along a long library corridor, there is a line of seats and decorative plants. You are given a **0-indexed** string `corridor` of length `n` consisting of letters `'S'` and `'P'` where each `'S'` represents a seat and each `'P'` represents a plant.

One room divider has **already** been installed to the left of index `0`, and **another** to the right of index `n - 1`. Additional room dividers can be installed. For each position between indices `i - 1` and `i` (`1 <= i <= n - 1`), at most one divider can be installed.

Divide the corridor into non-overlapping sections, where each section has **exactly two seats** with any number of plants. There may be multiple ways to perform the division. Two ways are **different** if there is a position with a room divider installed in the first way but not in the second way.

Return _the number of ways to divide the corridor_. Since the answer may be very large, return it **modulo** `109 + 7`. If there is no way, return `0`.

Example 1:



Input: corridor = "SSPPSPS" **Output:** 3 **Explanation:** There are 3 different ways to divide the corridor. The black bars in the above image indicate the two room dividers already installed. Note that in each of the ways, **each** section has exactly **two** seats.

Example 2:

Input: corridor = "PPSPSP" **Output:** 1 **Explanation:** There is only 1 way to divide the corridor, by not installing any additional dividers. Installing any would create some section that does not have exactly two seats.

Example 3:

Input: corridor = "S" **Output:** 0 **Explanation:** There is no way to divide the corridor because there will always be a section that does not have exactly two seats.

Constraints:

* `n == corridor.length` * `1 <= n <= 105` * `corridor[i]` is either `'S'` or `'P'`.

Code Snippets

C++:

```
class Solution {
public:
int numberOfWays(string corridor) {

}
};
```

Java:

```
class Solution {
public int numberOfWays(String corridor) {

}
}
```

Python3:

```
class Solution:
def numberOfWays(self, corridor: str) -> int:
```