Problem 2120: Execution of All Suffix Instructions Staying in a Grid

Problem Information

Difficulty: Medium
Acceptance Rate: 81.85%
Paid Only: No
Tags: String, Simulation

Problem Description

There is an `n x n` grid, with the top-left cell at `(0, 0)` and the bottom- right cell at `(n - 1, n - 1)`. You are given the integer `n` and an integer array `startPos` where `startPos = [startrow, startcol]` indicates that a robot is initially at cell `(startrow, startcol)`.

You are also given a **0-indexed** string `s` of length `m` where `s[i]` is the `ith` instruction for the robot: `'L'` (move left), `'R'` (move right), `'U'` (move up), and `'D'` (move down).

The robot can begin executing from any `ith` instruction in `s`. It executes the instructions one by one towards the end of `s` but it stops if either of these conditions is met:

* The next instruction will move the robot off the grid. * There are no more instructions left to execute.

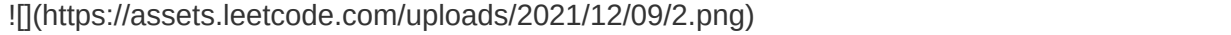
Return _an array_ `answer` _of length_ `m` _where_ `answer[i]` _is**the number of instructions** the robot can execute if the robot **begins executing from** the_ `ith` _instruction in_ `s`.

Example 1:

Input: n = 3, startPos = [0,1], s = "RRDDLU" **Output:** [1,5,4,3,1,0] **Explanation:** Starting from startPos and beginning execution from the ith instruction: - 0th: "_**R**_ RDDLU". Only one instruction "R" can be executed before it moves off the grid. - 1st: "_**RDDLU**_ ". All five instructions can be executed while it stays in the grid and ends at (1,

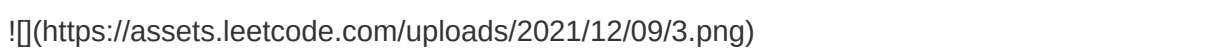
1). - 2nd: "_**DDLU**_ ". All four instructions can be executed while it stays in the grid and ends at (1, 0). - 3rd: "_**DLU**_ ". All three instructions can be executed while it stays in the grid and ends at (0, 0). - 4th: "_**L**_ U". Only one instruction "L" can be executed before it moves off the grid. - 5th: "U". If moving up, it would move off the grid.

Example 2:



Input: n = 2, startPos = [1,1], s = "LURD" **Output:** [4,1,0,0] **Explanation:** - 0th: "_**LURD**_ ". - 1st: "_**U**_ RD". - 2nd: "RD". - 3rd: "D".

Example 3:



Input: n = 1, startPos = [0,0], s = "LRUD" **Output:** [0,0,0,0] **Explanation:** No matter which instruction the robot begins execution from, it would move off the grid.

Constraints:

* `m == s.length` * `1 <= n, m <= 500` * `startPos.length == 2` * `0 <= startrow, startcol < n` * `s` consists of `'L'`, `'R'`, `'U'`, and `'D'`.

Code Snippets

C++:

```
class Solution {
public:
vector<int> executeInstructions(int n, vector<int>& startPos, string s) {

}
};
```

Java:

```
class Solution {
public int[] executeInstructions(int n, int[] startPos, String s) {
```

```
}
}
```

Python3:

```
class Solution:
def executeInstructions(self, n: int, startPos: List[int], s: str) ->
List[int]:
```