

# Problem 537: Complex Number Multiplication

## Problem Information

**Difficulty:** Medium

**Acceptance Rate:** 72.75%

**Paid Only:** No

**Tags:** Math, String, Simulation

## Problem Description

A [complex number]([https://en.wikipedia.org/wiki/Complex\\_number](https://en.wikipedia.org/wiki/Complex_number)) can be represented as a string on the form `\*\*real\*\* +\*\*imaginary\*\* i` where:

\* `real` is the real part and is an integer in the range `[-100, 100]`. \* `imaginary` is the imaginary part and is an integer in the range `[-100, 100]`. \* `i2 == -1`.

Given two complex numbers `num1` and `num2` as strings, return \_a string of the complex number that represents their multiplications\_.

**Example 1:**

**Input:** num1 = "1+1i", num2 = "1+1i" **Output:** "0+2i" **Explanation:**  $(1 + i) * (1 + i) = 1 + i^2 + 2 * i = 2i$ , and you need convert it to the form of 0+2i.

**Example 2:**

**Input:** num1 = "1+-1i", num2 = "1+-1i" **Output:** "0+-2i" **Explanation:**  $(1 - i) * (1 - i) = 1 + i^2 - 2 * i = -2i$ , and you need convert it to the form of 0+-2i.

**Constraints:**

\* `num1` and `num2` are valid complex numbers.

## Code Snippets

**C++:**

```
class Solution {  
public:  
    string complexNumberMultiply(string num1, string num2) {  
  
    }  
};
```

**Java:**

```
class Solution {  
public String complexNumberMultiply(String num1, String num2) {  
  
}  
}
```

**Python3:**

```
class Solution:  
    def complexNumberMultiply(self, num1: str, num2: str) -> str:
```