

# Problem 1257: Smallest Common Region

## Problem Information

**Difficulty:** Medium

**Acceptance Rate:** 68.22%

**Paid Only:** Yes

**Tags:** Array, Hash Table, String, Tree, Depth-First Search, Breadth-First Search

## Problem Description

You are given some lists of `regions` where the first region of each list **\*\*directly\*\*** contains all other regions in that list.

If a region `x` contains a region `y` **\_directly\_**, and region `y` contains region `z` **\_directly\_**, then region `x` is said to contain region `z` **\*\*indirectly\*\***. Note that region `x` also **\*\*indirectly\*\*** contains all regions **\*\*indirectly\*\*** contained in `y`.

Naturally, if a region `x` contains (either **\_directly\_** or **\_indirectly\_**) another region `y`, then `x` is bigger than or equal to `y` in size. Also, by definition, a region `x` contains itself.

Given two regions: `region1` and `region2`, return **\_the smallest region that contains both of them\_**.

It is guaranteed the smallest region exists.

**\*\*Example 1:\*\***

**\*\*Input:\*\*** regions = [["Earth","North America","South America"], ["North America","United States","Canada"], ["United States","New York","Boston"], ["Canada","Ontario","Quebec"], ["South America","Brazil"]], region1 = "Quebec", region2 = "New York" **\*\*Output:\*\*** "North America"

**\*\*Example 2:\*\***

**\*\*Input:\*\*** regions = [["Earth", "North America", "South America"],["North America", "United States", "Canada"],["United States", "New York", "Boston"],["Canada", "Ontario",

```
"Quebec"],["South America", "Brazil"]], region1 = "Canada", region2 = "South America"
**Output:** "Earth"
```

**\*\*Constraints:\*\***

\* `2` <= regions.length <= 104` \* `2` <= regions[i].length <= 20` \* `1` <= regions[i][j].length, region1.length, region2.length <= 20` \* `region1` != region2` \* `regions[i][j]`, `region1`, and `region2` consist of English letters. \* The input is generated such that there exists a region which contains all the other regions, either directly or indirectly. \* A region cannot be directly contained in more than one region.

## Code Snippets

### C++:

```
class Solution {
public:
    string findSmallestRegion(vector<vector<string>>& regions, string region1,
    string region2) {

    }
};
```

### Java:

```
class Solution {
    public String findSmallestRegion(List<List<String>> regions, String region1,
    String region2) {

    }
}
```

### Python3:

```
class Solution:
    def findSmallestRegion(self, regions: List[List[str]], region1: str, region2:
    str) -> str:
```