

2307. Check for Contradictions in Equations Premium

Hard Topics Companies Hint

You are given a 2D array of strings `equations` and an array of real numbers `values`, where `equations[i] = [Ai, Bi]` and `values[i]` means that `Ai / Bi = values[i]`.

Determine if there exists a contradiction in the equations. Return `true` *if there is a contradiction*, or `false` *otherwise*.

Note:

- When checking if two numbers are equal, check that their **absolute difference** is less than `10-5`.
- The testcases are generated such that there are no cases targeting precision, i.e. using `double` is enough to solve the problem.

Example 1:

Input: `equations = [["a","b"], ["b","c"], ["a","c"]]`, `values = [3,0.5,1.5]`
Output: `false`
Explanation:
The given equations are: `a / b = 3`, `b / c = 0.5`, `a / c = 1.5`
There are no contradictions in the equations. One possible assignment to satisfy all equations is:
`a = 3`, `b = 1` and `c = 2`.

Example 2:

Input: `equations = [["le","et"], ["le","code"], ["code","et"]]`, `values = [2,5,0.5]`
Output: `true`
Explanation:
The given equations are: `le / et = 2`, `le / code = 5`, `code / et = 0.5`
Based on the first two equations, we get `code / et = 0.4`.
Since the third equation is `code / et = 0.5`, we get a contradiction.

Constraints:

- `1 <= equations.length <= 100`
- `equations[i].length == 2`
- `1 <= Ai.length, Bi.length <= 5`
- `Ai`, `Bi` consist of lowercase English letters.
- `equations.length == values.length`
- `0.0 < values[i] <= 10.0`
- `values[i]` has a maximum of 2 decimal places.

Seen this question in a real interview before? 1/5

Yes No

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Hint 1

Try treating this as a graph problem.

Hint 2

Each variable is a node, and each equation is an edge.

Hint 3

Try performing DFS multiple times to find contradictions.

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