"Nearest Common Supervisor in Research Collaboration Network"

Simple Description

In a research institute, every project group has a supervising scientist. Each scientist reports to a higher-level scientist, forming a *hierarchical mentorship structure* (tree).
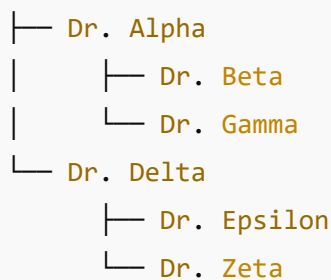Given two scientists, determine the **nearest common supervisor** who oversees both directly or indirectly.

Problem Statement

Find the *lowest common supervisor* (LCS) of two scientists in the mentorship hierarchy.

Hierarchy Example:

```
Director
    ├── Dr. Alpha
    │       ├── Dr. Beta
    │       └── Dr. Gamma
    └── Dr. Delta
            ├── Dr. Epsilon
            └── Dr. Zeta
```

Input Format
- Mentorship relationships (can be parent–child pairs)
- Two scientists' names

Example Query

```
LCS("Dr. Beta", "Dr. Gamma") → Dr. Alpha
```

Expected Output
Nearest supervisor common to both scientists.

Test Cases

1. `LCS("Dr. Beta", "Dr. Zeta") → Director`
2. `LCS("Dr. Epsilon", "Dr. Zeta") → Dr. Delta`
3. `LCS("Dr. Alpha", "Director") → Director`
4. `LCS("Dr. Gamma", "Dr. Delta") → Director`

Complexity
- Time: O(N)
- Space: O(H) (H = height of hierarchy tree)