1548. The Most Similar Path in a Graph

Description

We have `n` cities and `m` bi-directional `roads` where `roads[i] = [a_i, b_i]` connects city `a_i` with city `b_i`. Each city has a name consisting of exactly three upper-case English letters given in the string array `names`. Starting at any city `x`, you can reach any city `y` where `y != x` (i.e., the cities and the roads are forming an undirected connected graph).

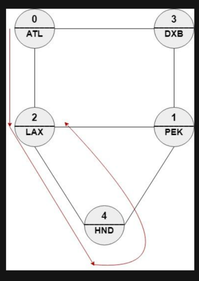
You will be given a string array `targetPath`. You should find a path in the graph of the **same length** and with the **minimum edit distance** to `targetPath`.

You need to return *the order of the nodes in the path with the minimum edit distance*. The path should be of the same length of `targetPath` and should be valid (i.e., there should be a direct road between `ans[i]` and `ans[i + 1]`). If there are multiple answers return any one of them.

The **edit distance** is defined as follows:

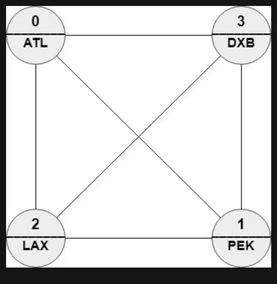
```
define editDistance(targetPath, myPath) {
    dis := 0
    a := targetPath.length
    b := myPath.length
    if a != b {
        return 1000000000
    }
    for (i := 0; i < a; i += 1) {
        if targetPath[i] != myPath[i] {
            dis += 1
        }
    }
    return dis
}
```

Example 1:



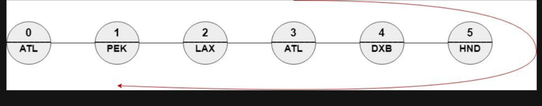

```
Input: n = 5, roads = [[0,2],[0,3],[1,2],[1,3],[1,4],[2,4]], names = ["ATL","PEK","LAX","DXB","HND"], targetPath = ["ATL","DXB","HND","LAX"]
Output: [0,2,4,2]
Explanation: [0,2,4,2], [0,3,0,2] and [0,3,1,2] are accepted answers.
[0,2,4,2] is equivalent to ["ATL","LAX","HND","LAX"] which has edit distance = 1 with targetPath.
[0,3,0,2] is equivalent to ["ATL","DXB","ATL","LAX"] which has edit distance = 1 with targetPath.
[0,3,1,2] is equivalent to ["ATL","DXB","PEK","LAX"] which has edit distance = 1 with targetPath.
```

Example 2:




```
Input: n = 4, roads = [[1,0],[2,0],[3,0],[2,1],[3,1],[3,2]], names = ["ATL","PEK","LAX","DXB"], targetPath =
["ABC","DEF","GHI","JKL","MNO","PQR","STU","VWX"]
Output: [0,1,0,1,0,1,0,1]
Explanation: Any path in this graph has edit distance = 8 with targetPath.
```

Example 3:




```
Input: n = 6, roads = [[0,1],[1,2],[2,3],[3,4],[4,5]], names = ["ATL","PEK","LAX","ATL","DXB","HND"], targetPath =
["ATL","DXB","HND","DXB","ATL","LAX","PEK"]
Output: [3,4,5,4,3,2,1]
Explanation: [3,4,5,4,3,2,1] is the only path with edit distance = 0 with targetPath.
It's equivalent to ["ATL","DXB","HND","DXB","ATL","LAX","PEK"]
```

Constraints:

- `2 <= n <= 100`
- `m == roads.length`
- `n - 1 <= m <= (n * (n - 1) / 2)`
- `0 <= a_i, b_i <= n - 1`
- `a_i != b_i`
- The graph is guaranteed to be **connected** and each pair of nodes may have **at most one** direct road.
- `names.length == n`
- `names[i].length == 3`
- `names[i]` consists of upper-case English letters.
- There can be two cities with **the same** name.
- `1 <= targetPath.length <= 100`
- `targetPath[i].length == 3`
- `targetPath[i]` consists of upper-case English letters.

Follow up: If each node can be visited only once in the path, What should you change in your solution?