

1548. The Most Similar Path in a Graph Premium

Hard Topics Companies Hint

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 $y \neq x$ (i.e., the cities and the roads are forming an undirected connected graph).

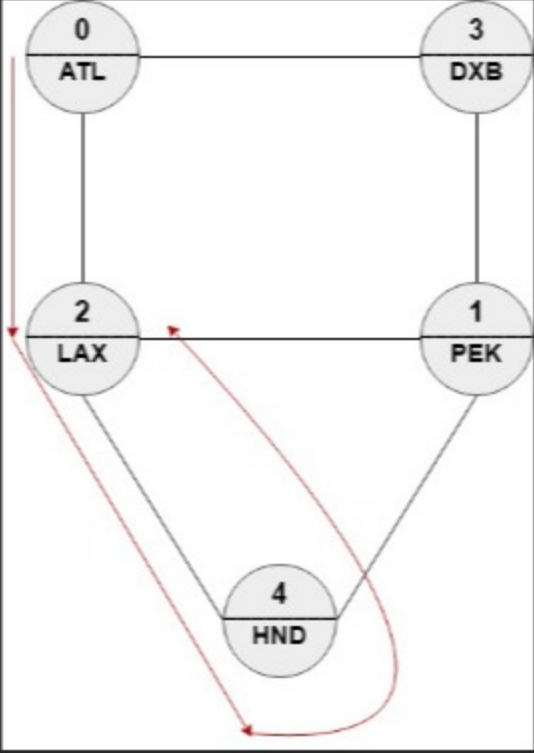
You will be given a string array `targetPath`. You should find a path in the graph of the **same length** and with the **minimum edit distance** to `targetPath`.

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:

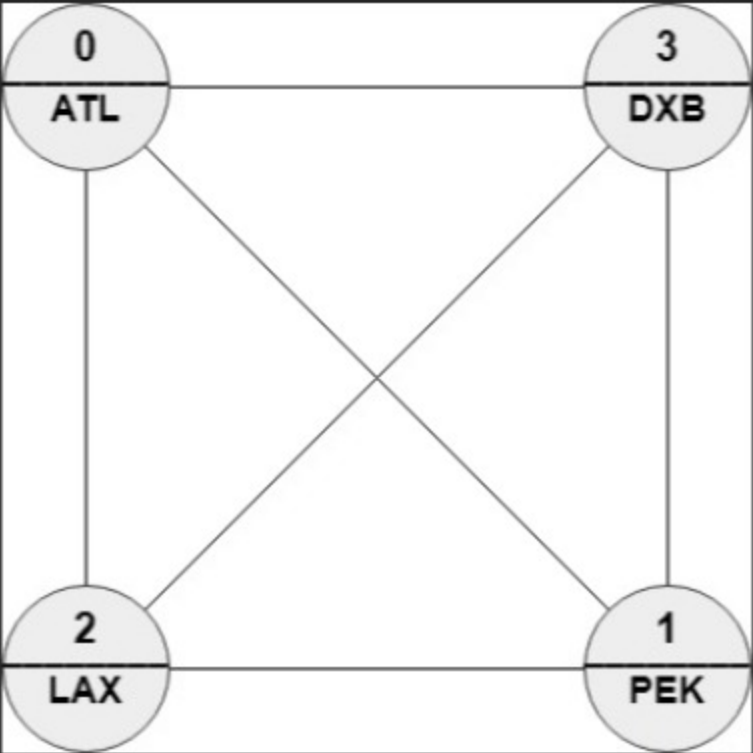
```
def editDistance(targetPath, myPath) {
    dis := 0
    a := targetPath.length
    b := myPath.length
    if a != b {
        return 1000000000
    }
    for (i := 0; i < a; i += 1) {
        if targetPath[i] != myPath[i] {
            dis += 1
        }
    }
    return dis
}
```

Example 1:



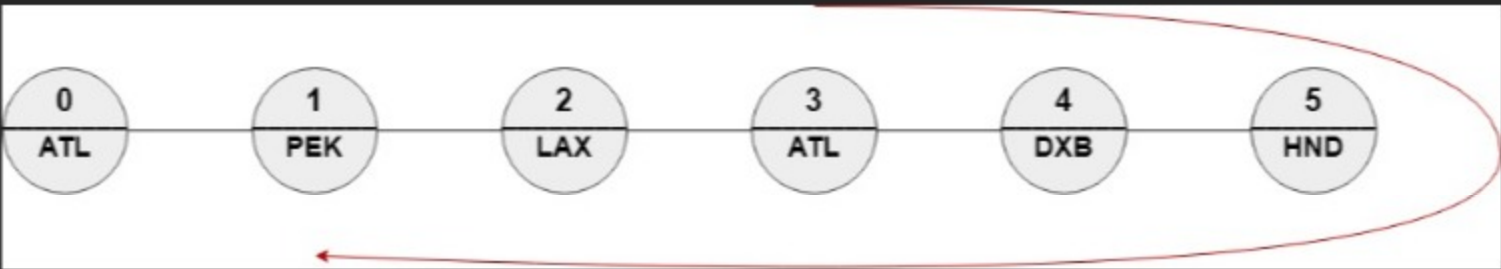
Input: `n = 5, roads = [[0,2],[0,3],[1,2],[1,3],[1,4],[2,4]], names = ["ATL","PEK","LAX","DXB","HND"], targetPath = ["ATL","DXB","HND","LAX"]`
Output: `[0,2,4,2]`
Explanation: `[0,2,4,2]`, `[0,3,0,2]` and `[0,3,1,2]` are accepted answers.
`[0,2,4,2]` is equivalent to `["ATL","LAX","HND","LAX"]` which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

- $2 \leq n \leq 100$
- $m == roads.length$
- $n - 1 \leq m \leq (n * (n - 1) / 2)$
- $0 \leq a_i, b_i \leq n - 1$
- $a_i \neq b_i$
- 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.
- $1 \leq targetPath.length \leq 100$
- `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?

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

Yes No

Accepted 17.5K | Submissions 29.6K | Acceptance Rate 59.2%

Topics

Dynamic ProgrammingGraph

Companies

0 - 6 monthsGoogle 2

Hint 1

Create an array dp where dp[i][j] is the min edit distance for the path starting at node i and compared to index j of the targetPath.

Hint 2

Traverse the dp array to obtain a valid answer.

Discussion (6)