Problem 2976: Minimum Cost to Convert String I

Problem Information

Difficulty: Medium
Acceptance Rate: 57.37%
Paid Only: No
Tags: Array, String, Graph, Shortest Path

Problem Description

You are given two **0-indexed** strings `source` and `target`, both of length `n` and consisting of **lowercase** English letters. You are also given two **0-indexed** character arrays `original` and `changed`, and an integer array `cost`, where `cost[i]` represents the cost of changing the character `original[i]` to the character `changed[i]`.

You start with the string `source`. In one operation, you can pick a character `x` from the string and change it to the character `y` at a cost of `z` **if** there exists **any** index `j` such that `cost[j] == z`, `original[j] == x`, and `changed[j] == y`.

Return _the**minimum** cost to convert the string _`source` _to the string_`target` _using**any** number of operations. If it is impossible to convert_ `source` _to_ `target`, _return_ `-1`.

Note that there may exist indices `i`, `j` such that `original[j] == original[i]` and `changed[j] == changed[i]`.

Example 1:

Input: source = "abcd", target = "acbe", original = ["a","b","c","c","e","d"], changed = ["b","c","b","e","b","e"], cost = [2,5,5,1,2,20] **Output:** 28 **Explanation:** To convert the string "abcd" to string "acbe": - Change value at index 1 from 'b' to 'c' at a cost of 5. - Change value at index 2 from 'c' to 'e' at a cost of 1. - Change value at index 2 from 'e' to 'b' at a cost of 2. - Change value at index 3 from 'd' to 'e' at a cost of 20. The total cost incurred is 5 + 1 + 2 + 20 = 28. It can be shown that this is the minimum possible cost.

Example 2:

Input: source = "aaaa", target = "bbbb", original = ["a","c"], changed = ["c","b"], cost = [1,2] **Output:** 12 **Explanation:** To change the character 'a' to 'b' change the character 'a' to 'c' at a cost of 1, followed by changing the character 'c' to 'b' at a cost of 2, for a total cost of 1 + 2 = 3. To change all occurrences of 'a' to 'b', a total cost of 3 * 4 = 12 is incurred.

Example 3:

Input: source = "abcd", target = "abce", original = ["a"], changed = ["e"], cost = [10000] **Output:** -1 **Explanation:** It is impossible to convert source to target because the value at index 3 cannot be changed from 'd' to 'e'.

Constraints:

* `1 <= source.length == target.length <= 105` * `source`, `target` consist of lowercase English letters. * `1 <= cost.length == original.length == changed.length <= 2000` * `original[i]`, `changed[i]` are lowercase English letters. * `1 <= cost[i] <= 106` * `original[i] != changed[i]`

Code Snippets

C++:

```
class Solution {
public:
long long minimumCost(string source, string target, vector<char>& original,
vector<char>& changed, vector<int>& cost) {

}
};
```

Java:

```
class Solution {
public long minimumCost(String source, String target, char[] original, char[]
changed, int[] cost) {

}
}
```

Python3:

```
class Solution:
def minimumCost(self, source: str, target: str, original: List[str], changed:
List[str], cost: List[int]) -> int:
```