

Longest Common Subsequence

Solution

Given two strings `text1` and `text2`, return the length of their longest common subsequence.

A *subsequence* of a string is a new string generated from the original string with some characters (can be none) deleted without changing the relative order of the remaining characters. (eg, "ace" is a subsequence of "abcde" while "aec" is not). A *common subsequence* of two strings is a subsequence that is common to both strings.

If there is no common subsequence, return 0.

Example 1:

Input: text1 = "abcde", text2 = "ace"
Output: 3
Explanation: The longest common subsequence is "ace" and its length is 3.

Example 2:

Input: text1 = "abc", text2 = "abc"
Output: 3
Explanation: The longest common subsequence is "abc" and its length is 3.

Example 3:

Input: text1 = "abc", text2 = "def"
Output: 0
Explanation: There is no such common subsequence, so the result is 0.

Constraints:

- 1 <= text1.length <= 1000
- 1 <= text2.length <= 1000
- The input strings consist of lowercase English characters only.

Hide Hint #1

Try dynamic programming. DP[i][j] represents the longest common subsequence of text1[0 ... i] & text2[0 ... j].

Hide Hint #2

DP[i][j] = DP[i - 1][j - 1] + 1, if text1[i] == text2[j] DP[i][j] = max(DP[i - 1][j], DP[i][j - 1]), otherwise


Java

```
1 class Solution {
2     public int longestCommonSubsequence(String text1, String text2) {
3
4         int[][] dp = new int[text1.length() + 1][text2.length() + 1];
5
6         for(int i = 1; i < dp.length; i++) {
7             char c1 = text1.charAt(i-1);
8             for(int j = 1; j < dp[0].length; j++) {
9                 char c2 = text2.charAt(j-1);
10                if(c1 == c2) {
11                    dp[i][j] = 1 + dp[i-1][j-1];
12                }
13                else {
14                    dp[i][j] = Math.max(dp[i-1][j], dp[i][j-1]);
15                }
16            }
17        }
18
19        return dp[dp.length-1][dp[0].length-1];
20    }
21 }
```

```
19         return apple.length < apple2.length &amp;
20     }
21 }
```

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 Run Code

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