

PromptScratchpadOur Solution(s)Video Explanation

Run Code

Solution 1Solution 2Solution 3Solution 4

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 using System.Collections.Generic;
4
5 public class Program {
6     // O(nm) time | O(nm) space
7     public static List<char> LongestCommonSubsequence(string str1, string str2) {
8         int[,] lcs = new int[str2.Length + 1, str1.Length + 1][];
9         for (int i = 0; i < str2.Length + 1; i++) {
10             for (int j = 0; j < str1.Length + 1; j++) {
11                 lcs[i, j] = new int[] { 0, 0, 0, 0 };
12             }
13         }
14         for (int i = 1; i < str2.Length + 1; i++) {
15             for (int j = 1; j < str1.Length + 1; j++) {
16                 if (str2[i - 1] == str1[j - 1]) {
17                     int[] newEntry =
18                         {(int)str2[i - 1], lcs[i - 1, j - 1][1] + 1, i - 1, j - 1};
19                     lcs[i, j] = newEntry;
20                 } else {
21                     if (lcs[i - 1, j][1] > lcs[i, j - 1][1]) {
22                         int[] newEntry = {-1, lcs[i - 1, j][1], i - 1, j};
23                         lcs[i, j] = newEntry;
24                     } else {
25                         int[] newEntry = {-1, lcs[i, j - 1][1], i, j - 1};
26                         lcs[i, j] = newEntry;
27                     }
28                 }
29             }
30         }
31         return buildSequence(lcs);
32     }
33
34     public static List<char> buildSequence(int[,][] lcs) {
35         List<char> sequence = new List<char>();
36         int i = lcs.GetLength(0) - 1;
37         int j = lcs.GetLength(1) - 1;
38         while (i != 0 && j != 0) {
39             int[] currentEntry = lcs[i, j];
40             if (currentEntry[0] != -1) {
41                 sequence.Insert(0, (char)currentEntry[0]);
42             }
43             i = currentEntry[2];
44             j = currentEntry[3];
45         }
46         return sequence;
47     }
48 }
49
```