

PromptScratchpadOur Solution(s)Video Explanation

Run Code

Solution 1Solution 2

```
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 - where n is the length of the
7     // first string and m is the length of the second string
8     public static bool InterweavingStrings(string one, string two, string three) {
9         if (three.Length != one.Length + two.Length) {
10             return false;
11         }
12
13         bool[,] cache = new bool?[one.Length+1, two.Length+1];
14         return areInterwoven(one, two, three, 0, 0, cache);
15     }
16
17     public static bool areInterwoven(string one, string two, string three, int i, int j,
18         bool[,] cache) {
19         if (cache[i,j].HasValue) {
20             return cache[i,j].Value;
21         }
22
23         int k = i + j;
24         if (k == three.Length) {
25             return true;
26         }
27
28         if (i < one.Length && one[i] == three[k]) {
29             cache[i,j] = areInterwoven(one, two, three, i + 1, j, cache);
30             if (cache[i,j].HasValue && cache[i,j].Value) {
31                 return true;
32             }
33         }
34
35         if (j < two.Length && two[j] == three[k]) {
36             cache[i,j] = areInterwoven(one, two, three, i, j + 1, cache);
37             return cache[i,j].Value;
38         }
39
40         cache[i,j] = false;
41         return false;
42     }
43 }
44
```