

Solution 1

Solution 2

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 class Program {
4     // O(nm) time | O(nm) space - where n is the length of the
5     // first string and m is the length of the second string
6     func interweavingStrings(_ one: String, _ two: String, _ three: String) -> Bool {
7         if three.length != one.length + two.length {
8             return false
9         }
10        var cache: [[Bool?]] = Array(repeating: Array(repeating: nil, count: two.length + 1), count: one.length + 1)
11        return areInterwoven(one, two, three, 0, 0, &cache)
12    }
13
14    func areInterwoven(_ one: String, _ two: String, _ three: String, _ i: Int, _ j: Int, _ cache: inout [[Bool?]]) -> Bool {
15        if let result = cache[i][j] {
16            return result
17        }
18
19        let k = i + j
20        if k == three.length {
21            return true
22        }
23
24        let oneI = one.index(one.startIndex, offsetBy: i)
25        let twoJ = two.index(two.startIndex, offsetBy: j)
26        let threeK = three.index(three.startIndex, offsetBy: k)
27        if i < one.length, one[oneI] == three[threeK] {
28            let result = areInterwoven(one, two, three, i + 1, j, &cache)
29            cache[i][j] = result
30            if result {
31                return true
32            }
33        }
34
35        if j < two.length, two[twoJ] == three[threeK] {
36            let result = areInterwoven(one, two, three, i, j + 1, &cache)
37            cache[i][j] = result
38            return result
39        }
40
41        cache[i][j] = false
42        return false
43    }
44 }
45
```

