AlgoExpert Quad Layout Swift 12px Sublime Monokai 00:00:00

Prompt Scratchpad Our Solution(s) Video Explanation Run Code

```
Solution 1
```

50

51 52 } return sequence

```
1\, // Copyright @ 2020 AlgoExpert, LLC. All rights reserved.
   class Program {
        // O(nc) time | O(nc) space
        func knapsackProblem(_ items: [[Int]], _ capacity: Int) -> (Int, [Int]) {
            var knapsackValues = [[Int]]()
 8
            for \_ in 0 ..< items.count + 1 \{
                let row = Array(repeating: 0, count: capacity + 1)
10
                knapsackValues.append(row)
11
12
13
            for currentItemIndex in 1 ..< items.count + 1 {</pre>
14
                let currentValue = items[currentItemIndex - 1][0]
15
                let currentWeight = items[currentItemIndex - 1][1]
16
                for currentCapacity in 0 ..< capacity + 1 {</pre>
17
18
                    if currentWeight <= currentCapacity {</pre>
                        knapsackValues[currentItemIndex][currentCapacity] = max(knapsackValues[currentItemIndex - 1][currentCapacity], knapsackValues[currentItemIndex - 1][currentCapacity - cur
19
20
21
                         knapsackValues[currentItemIndex][currentCapacity] = knapsackValues[currentItemIndex - 1][currentCapacity]
22
23
24
25
26
            return (knapsackValues[items.count][capacity], getKnapsackItems(items, knapsackValues))
27
28
29
        func getKnapsackItems(_ items: [[Int]], _ knapsackValues: [[Int]]) -> [Int] {
30
            var sequence = [Int]()
31
            var currentItemIndex = knapsackValues.count - 1
32
33
            var currentCapacity = knapsackValues[0].count - 1
34
35
            while currentItemIndex > 0 {
                 \textbf{if} \ knapsackValues[currentItemIndex][currentCapacity] == knapsackValues[currentItemIndex - 1][currentCapacity] \ \{ (knapsackValues[currentItemIndex] - 1 \} \} 
36
37
                    currentItemIndex -= 1
38
                } else {
                    sequence.insert(currentItemIndex - 1, at: 0)
39
40
41
                    currentCapacity -= items[currentItemIndex - 1][1]
                    currentItemIndex -= 1
42
43
44
                if currentCapacity == 0 {
45
46
                    break
47
48
49
```