

Solution 1Solution 2Solution 3

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 package main
4
5 // Average case: when the created BST is balanced
6 // O(nlog(n)) time | O(n) space - where n is the length of the array
7 // ---
8 // Worst case: when the the created BST is like a linked list
9 // O(n^2) time | O(n) space
10 ▾ func RightSmallerThan(array []int) []int {
11 ▾   if len(array) == 0 {
12     return []int{}
13   }
14
15   rightSmallerCounts := make([]int, 0, len(array))
16 ▾   for _, i := range array {
17     rightSmallerCounts = append(rightSmallerCounts, i)
18   }
19   lastIdx := len(array) - 1
20   bst := NewSpecialBST(array[lastIdx])
21   rightSmallerCounts[lastIdx] = 0
22 ▾   for i := lastIdx - 1; i >= 0; i-- {
23     bst.Insert(array[i], i, rightSmallerCounts)
24   }
25   return rightSmallerCounts
26 }
27
28 ▾ type SpecialBST struct {
29   Value      int
30   LeftSubtreeSize int
31
32   Left *SpecialBST
33   Right *SpecialBST
34 }
35
36 ▾ func NewSpecialBST(value int) *SpecialBST {
37 ▾   return &SpecialBST{
38     Value:      value,
39     LeftSubtreeSize: 0,
40     Left:        nil,
41     Right:       nil,
42   }
43 }
44
45 ▾ func (bst *SpecialBST) Insert(value, idx int, rightSmallerCounts []int) {
46   bst.insert(value, idx, rightSmallerCounts, 0)
47 }
48
49 ▾ func (bst *SpecialBST) insert(value, idx int, rightSmallerCounts []int, numSmallerAtInsertTime int) {
50 ▾   if value < bst.Value {
51     bst.LeftSubtreeSize += 1
52 ▾     if bst.Left == nil {
53       bst.Left = NewSpecialBST(value)
54       rightSmallerCounts[idx] = numSmallerAtInsertTime
55 ▾     } else {
56       bst.Left.insert(value, idx, rightSmallerCounts, numSmallerAtInsertTime)
57     }
58     return
59   }
60
61   numSmallerAtInsertTime += bst.LeftSubtreeSize
62 ▾   if value > bst.Value {
63     numSmallerAtInsertTime += 1
64   }
65
66 ▾   if bst.Right == nil {
67     bst.Right = NewSpecialBST(value)
68     rightSmallerCounts[idx] = numSmallerAtInsertTime
69 ▾   } else {
70     bst.Right.insert(value, idx, rightSmallerCounts, numSmallerAtInsertTime)
71   }
72 }
73
```

