

Solution 1Solution 2Solution 3

```
1  // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3  // Average case: when the created BST is balanced
4  // O(nlog(n)) time | O(n) space - where n is the length of the array
5  // ---
6  // Worst case: when the the created BST is like a linked list
7  // O(n^2) time | O(n) space
8  ▾ function rightSmallerThan(array) {
9      if (array.length === 0) return [];
10
11     const lastIdx = array.length - 1;
12     const bst = new SpecialBST(array[lastIdx], lastIdx, 0);
13  ▾ for (let i = array.length - 2; i >= 0; i--) {
14     bst.insert(array[i], i);
15 }
16
17 const rightSmallerCounts = array.slice();
18 getRightSmallerCounts(bst, rightSmallerCounts);
19 return rightSmallerCounts;
20 }
21
22 ▾ function getRightSmallerCounts(bst, rightSmallerCounts) {
23     if (bst === null) return;
24     rightSmallerCounts[bst.idx] = bst.numSmallerAtInsertTime;
25     getRightSmallerCounts(bst.left, rightSmallerCounts);
26     getRightSmallerCounts(bst.right, rightSmallerCounts);
27 }
28
29 ▾ class SpecialBST {
30     ▾ constructor(value, idx, numSmallerAtInsertTime) {
31         this.value = value;
32         this.idx = idx;
33         this.numSmallerAtInsertTime = numSmallerAtInsertTime;
34         this.leftSubtreeSize = 0;
35         this.left = null;
36         this.right = null;
37     }
38
39     ▾ insert(value, idx, numSmallerAtInsertTime = 0) {
40     ▾ if (value < this.value) {
41         this.leftSubtreeSize++;
42     ▾ if (this.left === null) {
43         this.left = new SpecialBST(value, idx, numSmallerAtInsertTime);
44     ▾ } else {
45         this.left.insert(value, idx, numSmallerAtInsertTime);
46     }
47     ▾ } else {
48         numSmallerAtInsertTime += this.leftSubtreeSize;
49         if (value > this.value) numSmallerAtInsertTime++;
50     ▾ if (this.right === null) {
51         this.right = new SpecialBST(value, idx, numSmallerAtInsertTime);
52     ▾ } else {
53         this.right.insert(value, idx, numSmallerAtInsertTime);
54     }
55     }
56     }
57 }
58
59 exports.rightSmallerThan = rightSmallerThan;
60
```

