

Solution 1	Solution 2	Solution 3
<pre>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 ▾ def rightSmallerThan(array): 9 ▾ if len(array) == 0: 10 return [] 11 12 lastIdx = len(array) - 1 13 bst = SpecialBST(array[lastIdx], lastIdx, 0) 14 ▾ for i in reversed(range(len(array) - 1)): 15 bst.insert(array[i], i) 16 17 rightSmallerCounts = array[:] 18 getRightSmallerCounts(bst, rightSmallerCounts) 19 return rightSmallerCounts 20 21 22 ▾ def getRightSmallerCounts(bst, rightSmallerCounts): 23 ▾ if bst is None: 24 return 25 26 rightSmallerCounts[bst.idx] = bst.numSmallerAtInsertTime 27 getRightSmallerCounts(bst.left, rightSmallerCounts) 28 getRightSmallerCounts(bst.right, rightSmallerCounts) 29 30 ▾ class SpecialBST: 31 ▾ def __init__(self, value, idx, numSmallerAtInsertTime): 32 self.value = value 33 self.idx = idx 34 self.numSmallerAtInsertTime = numSmallerAtInsertTime 35 self.leftSubtreeSize = 0 36 self.left = None 37 self.right = None 38 39 ▾ def insert(self, value, idx, numSmallerAtInsertTime=0): 40 ▾ if value < self.value: 41 self.leftSubtreeSize += 1 42 ▾ if self.left is None: 43 self.left = SpecialBST(value, idx, numSmallerAtInsertTime) 44 ▾ else: 45 self.left.insert(value, idx, numSmallerAtInsertTime) 46 ▾ else: 47 numSmallerAtInsertTime += self.leftSubtreeSize 48 ▾ if value > self.value: 49 numSmallerAtInsertTime += 1 50 ▾ if self.right is None: 51 self.right = SpecialBST(value, idx, numSmallerAtInsertTime) 52 ▾ else: 53 self.right.insert(value, idx, numSmallerAtInsertTime) 54</pre>		

