AlgoExpert Quad Layout C++ 12px Sublime Monokai 00:00:00

Prompt Scratchpad Our Solution(s) Video Explanation Run Code

Solution 1

```
1\, // Copyright @ 2020 AlgoExpert, LLC. All rights reserved.
 3 #include <vector>
 4 using namespace std;
 6 void quickSortHelper(vector<int> &array, int startIdx, int endIdx);
 8 // Best: O(n\log(n)) time | O(\log(n)) space
9 // Average: O(nlog(n)) time | O(log(n)) space
10 // Worst: O(n^2) time | O(log(n)) space
11 vector<int> quickSort(vector<int> array) {
    quickSortHelper(array, 0, array.size() - 1);
13
    return array;
14 }
15
16 void quickSortHelper(vector<int> &array, int startIdx, int endIdx) {
17
     if (startIdx >= endIdx) {
18
       return;
19
20
      int pivotIdx = startIdx;
21
      int leftIdx = startIdx + 1;
      int rightIdx = endIdx;
22
23
      while (rightIdx >= leftIdx) {
24
       if (array.at(leftIdx) > array.at(pivotIdx) &&
25
           array.at(rightIdx) < array.at(pivotIdx)) {</pre>
26
          swap(array[leftIdx], array[rightIdx]);
27
        if (array.at(leftIdx) <= array.at(pivotIdx)) {</pre>
28
29
          leftIdx += 1;
30
31
        if (array.at(rightIdx) >= array.at(pivotIdx)) {
          rightIdx -= 1;
32
33
34
      swap(array[pivotIdx], array[rightIdx]);
35
      bool leftSubarrayIsSmaller =
36
37
         rightIdx - 1 - startIdx < endIdx - (rightIdx + 1);</pre>
      if (leftSubarrayIsSmaller) {
38
39
       quickSortHelper(array, startIdx, rightIdx - 1);
40
        quickSortHelper(array, rightIdx + 1, endIdx);
41
        quickSortHelper(array, rightIdx + 1, endIdx);
43
        quickSortHelper(array, startIdx, rightIdx - 1);
44
45 }
46
```