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

Prompt Scratchpad Our Solution(s) Video Explanation Run Code

Solution 1

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```
1\, // Copyright @ 2020 AlgoExpert, LLC. All rights reserved.
 3 #include <vector>
 4 using namespace std;
 6 int quickselectHelper(vector<int> array, int startIdx, int endIdx,
                          int position);
9 // Best: O(n) time | O(1) space
10 // Average: O(n) time | O(1) space
11 // Worst: O(n^2) time | O(1) space
12 int quickselect(vector<int> array, int k) {
13
     int position = k - 1;
14
      return quickselectHelper(array, 0, array.size() - 1, position);
15 }
16
17 int \; quickselectHelper(vector < int > array, int startIdx, int endIdx,
                          int position) {
18
      while (true) {
19
20
       if (startIdx > endIdx) {
21
          perror("Your Algorithm should never arrive here!");
22
          exit(1);
23
24
        int pivotIdx = startIdx;
25
        int leftIdx = startIdx + 1;
26
        int rightIdx = endIdx;
        while (leftIdx <= rightIdx) {</pre>
27
          if (array[leftIdx] > array[pivotIdx] &&
28
29
              array[rightIdx] < array[pivotIdx]) {</pre>
30
            swap(array[leftIdx], array[rightIdx]);
31
32
          \textbf{if} \ (\texttt{array}[\texttt{leftIdx}] \ \texttt{<=} \ \texttt{array}[\texttt{pivotIdx}]) \ \{
            leftIdx++;
33
34
          if (array[rightIdx] >= array[pivotIdx]) {
35
            rightIdx--;
36
37
38
39
        swap(array[pivotIdx], array[rightIdx]);
40
        if (rightIdx == position) {
41
          return array[rightIdx];
42
        } else if (rightIdx < position) {</pre>
          startIdx = rightIdx + 1;
43
        } else {
44
45
          endIdx = rightIdx - 1;
46
47
48 }
```