AlgoExpert Quad Layout Java 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.
    class Program {
      // Best: O(n) time | O(1) space
      // Average: O(n) time | O(1) space
      // Worst: O(n^2) time | O(1) space
      public static int quickselect(int[] array, int k) {
        int position = k - 1;
        return quickselect(array, 0, array.length - 1, position);
10
11
      public static int quickselect(int[] array, int startIdx, int endIdx, int position) {
12
13
        while (true) {
14
          \textbf{if} \text{ (startIdx > endIdx) } \{
15
             throw new RuntimeException("Your Algorithm should never arrive here!");
16
17
          int pivotIdx = startIdx;
18
          int leftIdx = startIdx + 1;
          int rightIdx = endIdx;
19
20
          while (leftIdx <= rightIdx) {</pre>
21
             if (array[leftIdx] > array[pivotIdx] && array[rightIdx] < array[pivotIdx]) {</pre>
22
               swap(leftIdx, rightIdx, array);
23
24
             \textbf{if} \ (\texttt{array}[\texttt{leftIdx}] \ \texttt{<=} \ \texttt{array}[\texttt{pivotIdx}]) \ \{
25
               leftIdx++;
26
27
             if (array[rightIdx] >= array[pivotIdx]) {
28
              rightIdx--;
29
30
          swap(pivotIdx, rightIdx, array);
31
          if (rightIdx == position) {
32
            return array[rightIdx];
33
34
          } else if (rightIdx < position) {</pre>
35
            startIdx = rightIdx + 1;
          } else {
36
37
            endIdx = rightIdx - 1;
38
39
40
41
      public static void swap(int i, int j, int[] array) {
43
        int temp = array[j];
        array[j] = array[i];
44
45
        array[i] = temp;
46
47
```