

Our Solution(s)

Run Code

Your Solutions

Run Code

Solution 1

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 #include <vector>
4 using namespace std;
5
6 int quickselectHelper(vector<int> array, int startIdx, int endIdx,
7                       int position);
8
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,
18                       int position) {
19     while (true) {
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;
27         while (leftIdx <= rightIdx) {
28             if (array[leftIdx] > array[pivotIdx] &&
29                 array[rightIdx] < array[pivotIdx]) {
30                 swap(array[leftIdx], array[rightIdx]);
31             }
32             if (array[leftIdx] <= array[pivotIdx]) {
33                 leftIdx++;
34             }
35             if (array[rightIdx] > array[pivotIdx]) {
36                 rightIdx--;
37             }
38         }
39         swap(array[pivotIdx], array[rightIdx]);
40         if (position < rightIdx) {
41             return quickselectHelper(array, startIdx, rightIdx, position);
42         } else if (position > rightIdx) {
43             return quickselectHelper(array, rightIdx + 1, endIdx, position);
44         } else {
45             return array[rightIdx];
46         }
47     }
48 }
```

Our Tests

```
1 // Test 1: [1, 2, 3, 4, 5], k = 2, expected = 2
2 // Test 2: [1, 2, 3, 4, 5], k = 5, expected = 5
3 // Test 3: [1, 2, 3, 4, 5], k = 1, expected = 1
4 // Test 4: [1, 2, 3, 4, 5], k = 3, expected = 3
5 // Test 5: [1, 2, 3, 4, 5], k = 4, expected = 4
```

Solution 1   Solution 2   Solution 3

```
1 #include <vector>
2 using namespace std;
3
4 int quickselect(vector<int> array, int k) {
5     // Write your code here.
6     return -1;
7 }
8
```

Custom Output

Submit Code

```
1 // Custom Output
2
3
```

Run or submit code when you're ready.