QuickSort.java

```
1   package com.example.SortingAlgos;
2
3   import java.util.List;
4
5   public class QuickSort {
6       int partition(List<Integer> arr, int low, int high) {
7           int pivot = arr.get(low);
8           int i = low;
9           int j = high;
10
11 2        while (i < j) {
12 5            while (arr.get(i) <= pivot && i <= high - 1) {
13 1                i++;
14              }
15
16 5            while (arr.get(j) > pivot && j >= low + 1) {
17 1                j--;
18              }
19 2            if (i < j) {
20                  int temp = arr.get(i);
21                  arr.set(i, arr.get(j));
22                  arr.set(j, temp);
23              }
24          }
25          int temp = arr.get(low);
26          arr.set(low, arr.get(j));
27          arr.set(j, temp);
28 1        return j;
29      }
30
31      void qs(List<Integer> arr, int low, int high) {
32 2        if (low < high) {
33              int pIndex = partition(arr, low, high);
34 2            qs(arr, low, pIndex - 1);
35 2            qs(arr, pIndex + 1, high);
36          }
37      }
38
39      public List<Integer> quickSort(List<Integer> arr) {
40          // Write your code here.
41 2        qs(arr, 0, arr.size() - 1);
```

```
42 1          return arr;
43        }
44    }
```

Mutations

11	1. changed conditional boundary → TIMED_OUT 2. negated conditional → KILLED
12	1. negated conditional → TIMED_OUT 2. changed conditional boundary → KILLED 3. changed conditional boundary → TIMED_OUT 4. negated conditional → TIMED_OUT 5. Replaced integer subtraction with addition → KILLED
13	1. Changed increment from 1 to -1 → KILLED
16	1. Replaced integer addition with subtraction → SURVIVED 2. negated conditional → TIMED_OUT 3. negated conditional → TIMED_OUT 4. changed conditional boundary → SURVIVED 5. changed conditional boundary → KILLED
17	1. Changed increment from -1 to 1 → KILLED
19	1. negated conditional → KILLED 2. changed conditional boundary → SURVIVED
28	1. replaced int return with 0 for com/example/SortingAlgos/QuickSort::partition → KILLED
32	1. negated conditional → KILLED 2. changed conditional boundary → SURVIVED
34	1. Replaced integer subtraction with addition → KILLED 2. removed call to com/example/SortingAlgos/QuickSort::qs → KILLED
35	1. removed call to com/example/SortingAlgos/QuickSort::qs → KILLED 2. Replaced integer addition with subtraction → KILLED
41	1. Replaced integer subtraction with addition → KILLED 2. removed call to com/example/SortingAlgos/QuickSort::qs → KILLED
42	1. replaced return value with Collections.emptyList for com/example/SortingAlgos/QuickSort::quickSort → KILLED

Active mutators

- CONDITIONALS_BOUNDARY
- EMPTY_RETURNS
- FALSE_RETURNS
- INCREMENTS
- INVERT_NEGS
- MATH
- NEGATE_CONDITIONALS
- NULL_RETURNS
- PRIMITIVE_RETURNS
- TRUE_RETURNS
- VOID_METHOD_CALLS

Tests examined

- com.example.SortingAlgos.QuickSortTest.testSort(com.example.SortingAlgos.QuickSortTest) (0 ms)

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