

MergeSort.java

```

1  package com.example.SortingAlgos;
2
3  import java.util.ArrayList;
4
5  public class MergeSort {
6      private void merge(int[] arr, int low, int mid, int high) {
7          ArrayList<Integer> temp = new ArrayList<>(); // temporary array
8          int left = low; // starting index of left half of arr
9          int right = mid + 1; // starting index of right half of arr
10
11          // storing elements in the temporary array in a sorted manner//
12
13          while (left <= mid && right <= high) {
14              if (arr[left] <= arr[right]) {
15                  temp.add(arr[left]);
16                  left++;
17              } else {
18                  temp.add(arr[right]);
19                  right++;
20              }
21          }
22
23          // if elements on the left half are still left //
24
25          while (left <= mid) {
26              temp.add(arr[left]);
27              left++;
28          }
29
30          // if elements on the right half are still left //
31          while (right <= high) {
32              temp.add(arr[right]);
33              right++;
34          }
35
36          // transferring all elements from temporary to arr //
37          for (int i = low; i <= high; i++) {
38              arr[i] = temp.get(i - low);
39          }
40      }
41
42      public int[] mergeSort(int[] arr, int low, int high) {
43          if (low >= high)
44              return new int[] {};
45          int mid = (low + high) / 2;

```

```

46         mergeSort(arr, low, mid); // left half
47 1         mergeSort(arr, mid + 1, high); // right half
48 1         merge(arr, low, mid, high); // merging sorted halves
49 1         return arr;
50     }
51 }

```

Mutations

9	1. Replaced integer addition with subtraction → KILLED
	1. changed conditional boundary → KILLED
13	2. negated conditional → KILLED
	3. changed conditional boundary → KILLED
	4. negated conditional → KILLED
14	1. changed conditional boundary → SURVIVED
	2. negated conditional → KILLED
19	1. Changed increment from 1 to -1 → KILLED
25	1. changed conditional boundary → KILLED
	2. negated conditional → KILLED
31	1. changed conditional boundary → KILLED
	2. negated conditional → KILLED
37	1. negated conditional → KILLED
	2. changed conditional boundary → KILLED
38	1. Replaced integer subtraction with addition → KILLED
43	1. negated conditional → KILLED
	2. changed conditional boundary → KILLED
44	1. replaced return value with null for com/example/SortingAlgos/MergeSort::mergeSort → SURVIVED
45	1. Replaced integer division with multiplication → KILLED
	2. Replaced integer addition with subtraction → KILLED
47	1. Replaced integer addition with subtraction → KILLED
48	1. removed call to com/example/SortingAlgos/MergeSort::merge → KILLED
49	1. replaced return value with null for com/example/SortingAlgos/MergeSort::mergeSort → 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.MergeSortTest.testSort(com.example.SortingAlgos.MergeSortTest) (0 ms)

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