# LargestIsland.java

```
1   package com.example;
2
3   // public class LargestIsland {
4
5   // }
6   class LargestIsland {
7       public int largestIsland(int[][] grid) {
8   2       int[] componentSizes = new int[grid.length * grid.length + 2];
9           int max = 0;
10          int id = 2;
11  3       for (int i = 0; i < grid.length; i++) {
12  3           for (int j = 0; j < grid.length; j++) {
13  1               if (grid[i][j] == 1) {
14                      int[] size = new int[1];
15  1                   dfs(grid, componentSizes, id, i, j);
16  2                   if(componentSizes[id] > max){
17                          max = componentSizes[id];
18                      }
19  1                   id++;
20                  }
21              }
22          }
23  3       for (int i = 0; i < grid.length; i++) {
24  3           for (int j = 0; j < grid.length; j++) {
25  1               if (grid[i][j] == 0) {
26  1                   max = Math.max(max, getNeighborSum(grid, componentSizes, i, j) + 1);
27                  }
28              }
29          }
30  1       return max;
31      }
32      private void dfs(int[][] grid, int[] componentSizes, int id, int i, int j) {
33  9       if (i < 0 || j < 0 || i >= grid.length || j >= grid[0].length || grid[i][j] != 1) return;
34          grid[i][j] = id;
35  1       componentSizes[id]++;
36  2       dfs(grid, componentSizes, id, i-1, j);
37  2       dfs(grid, componentSizes, id, i, j-1);
38  2       dfs(grid, componentSizes, id, i+1, j);
39  2       dfs(grid, componentSizes, id, i, j+1);
40      }
41      private int getNeighborSum(int[][] grid, int[] componentSizes, int i, int j) {
42          int[] ids = new int[4];
43          int sum = 0;
44  3       if(i-1 >= 0){
45  1           ids[0] = grid[i-1][j];
46          }
47  3       if(i+1 < grid.length){
48  1           ids[1] = grid[i+1][j];
49          }
50  3       if(j-1 >= 0){
51  1           ids[2] = grid[i][j-1];
52          }
53  3       if(j+1 < grid.length){
54  1           ids[3] = grid[i][j+1];
55          }
56          sum = componentSizes[ids[0]];
57  1       if(ids[1] != ids[0]){
58  1           sum += componentSizes[ids[1]];
59          }
60  2       if(ids[2] != ids[0] && ids[2] != ids[1]){
61  1           sum += componentSizes[ids[2]];
62          }
63  3       if(ids[3] != ids[0] && ids[3] != ids[1] && ids[3] != ids[2]){
64  1           sum += componentSizes[ids[3]];
65          }
66  1       return sum;
67      }
68  }
```

## Mutations

| | |
|---|---|
| 8 | 1. Replaced integer multiplication with division → KILLED<br>2. Replaced integer addition with subtraction → SURVIVED |
| 11 | 1. changed conditional boundary → KILLED<br>2. Changed increment from 1 to -1 → KILLED<br>3. negated conditional → KILLED |
| 12 | 1. changed conditional boundary → KILLED<br>2. Changed increment from 1 to -1 → KILLED<br>3. negated conditional → KILLED |
| 13 | 1. negated conditional → KILLED |
| 15 | 1. removed call to com/example/LargestIsland::dfs → KILLED |
| 16 | 1. changed conditional boundary → SURVIVED<br>2. negated conditional → SURVIVED |
| 19 | 1. Changed increment from 1 to -1 → KILLED |
| 23 | 1. changed conditional boundary → KILLED<br>2. Changed increment from 1 to -1 → KILLED<br>3. negated conditional → KILLED |
| 24 | 1. changed conditional boundary → KILLED<br>2. Changed increment from 1 to -1 → KILLED<br>3. negated conditional → KILLED |
| 25 | 1. negated conditional → KILLED |
| 26 | 1. Replaced integer addition with subtraction → KILLED |
| 30 | 1. replaced int return with 0 for com/example/LargestIsland::largestIsland → KILLED |
| 33 | 1. changed conditional boundary → KILLED<br>2. changed conditional boundary → KILLED<br>3. changed conditional boundary → KILLED<br>4. changed conditional boundary → KILLED<br>5. negated conditional → KILLED<br>6. negated conditional → KILLED<br>7. negated conditional → KILLED<br>8. negated conditional → KILLED<br>9. negated conditional → KILLED |
| 35 | 1. Replaced integer addition with subtraction → KILLED |
| 36 | 1. Replaced integer subtraction with addition → SURVIVED<br>2. removed call to com/example/LargestIsland::dfs → SURVIVED |
| 37 | 1. Replaced integer subtraction with addition → KILLED<br>2. removed call to com/example/LargestIsland::dfs → KILLED |
| 38 | 1. Replaced integer addition with subtraction → KILLED<br>2. removed call to com/example/LargestIsland::dfs → KILLED |
| 39 | 1. Replaced integer addition with subtraction → KILLED<br>2. removed call to com/example/LargestIsland::dfs → KILLED |
| 44 | 1. changed conditional boundary → SURVIVED<br>2. Replaced integer subtraction with addition → KILLED<br>3. negated conditional → KILLED |
| 45 | 1. Replaced integer subtraction with addition → KILLED |
| 47 | 1. changed conditional boundary → KILLED<br>2. Replaced integer addition with subtraction → KILLED<br>3. negated conditional → KILLED |
| 48 | 1. Replaced integer addition with subtraction → KILLED |
| 50 | 1. changed conditional boundary → SURVIVED<br>2. Replaced integer subtraction with addition → KILLED<br>3. negated conditional → KILLED |
| 51 | 1. Replaced integer subtraction with addition → KILLED |
| 53 | 1. changed conditional boundary → KILLED<br>2. Replaced integer addition with subtraction → KILLED<br>3. negated conditional → KILLED |
| 54 | 1. Replaced integer addition with subtraction → KILLED |
| 57 | 1. negated conditional → KILLED |
| 58 | 1. Replaced integer addition with subtraction → KILLED |
| 60 | 1. negated conditional → KILLED<br>2. negated conditional → KILLED |
| 61 | 1. Replaced integer addition with subtraction → KILLED |
| 63 | 1. negated conditional → KILLED<br>2. negated conditional → KILLED<br>3. negated conditional → KILLED |
| 64 | 1. Replaced integer addition with subtraction → KILLED |
| 66 | 1. replaced int return with 0 for com/example/LargestIsland::getNeighborSum → KILLED |

## Active mutators

- BOOLEAN_FALSE_RETURN
- BOOLEAN_TRUE_RETURN
- CONDITIONALS_BOUNDARY_MUTATOR
- EMPTY_RETURN_VALUES
- INCREMENTS_MUTATOR
- INVERT_NEGS_MUTATOR
- MATH_MUTATOR
- NEGATE_CONDITIONALS_MUTATOR
- NULL_RETURN_VALUES

- PRIMITIVE_RETURN_VALS_MUTATOR
- VOID_METHOD_CALL_MUTATOR

## Tests examined

- com.example.LargestIslandTest.testLargestIsland1(com.example.LargestIslandTest) (0 ms)
- com.example.LargestIslandTest.testLargestIsland2(com.example.LargestIslandTest) (1 ms)
- com.example.LargestIslandTest.testLargestIsland3(com.example.LargestIslandTest) (0 ms)
- com.example.LargestIslandTest.testLargestIsland4(com.example.LargestIslandTest) (1 ms)

Report generated by PIT 1.5.0