Number of Islands

Try to solve the Number of Islands problem.

We'll cover the following

Statement

Let's consider a scenario with an $(m \times n)$ 2D grid containing binary numbers, where `'0'` represents water and `'1'` represents land. If any `'1'` cells are connected to each other horizontally or vertically (not diagonally), they form an island. Your task is to return the total number of islands in the grid.

Constraints:

- $1 \leq$ `grid.length` ≤ 300
- $1 \leq$ `grid[i].length` ≤ 300
- `grid[i][j]` is either `'0'` or `'1'`.

Examples

Sample example 1

Input

'1'	'1'	'1'
'0'	'1'	'0'
'1'	'0'	'0'
'1'	'0'	'1'

Output

3

Total number of islands is three:
1. Four cell 1s connected adjacently on top.
2. One island made from two cell 1s connected in bottom-left corner.
3. One isolated island at the bottom-right of the grid.

Sample example 2

Input

'0'	'1'	'0'
'1'	'0'	'1'
'0'	'1'	'0'

Output

4

Four separate islands as no cell with value 1 is adjacently connected with any other cell 1.

0	1	0

2 of 3

Sample example 3

Input

'1'	'0'	'0'	'0'
'0'	'1'	'0'	'0'
'0'	'0'	'1'	'0'
'0'	'0'	'0'	'1'

Output

4

Four separate islands as no cell 1 is adjacently connected with any other cell 1.

3 of 3

Understand the problem

Let's take a moment to make sure you've correctly understood the problem. The quiz below helps you check if you're solving the correct problem:

Number of Islands

1 What is the output if the following grid is given as input?

$$grid = \begin{matrix}[[1,0,0],\\ [0,0,0],\\ [0,0,1]]\end{matrix}$$

A) 1

B) 0

C) 2

D) 3

Submit Answer

Question 1 of 3
0 attempted

Reset Quiz

Figure it out!

We have a game for you to play. Rearrange the logical building blocks to develop a clearer understanding of how to solve this problem.

Drag and drop the cards to rearrange them in the correct sequence.

Count all occurrences of cell 1s in the grid and store them in a variable called `count`.

Traverse the grid, and whenever a cell 1 is encountered, check whether this cell 1 has a neighboring cell 1 on its top, bottom, left, or right.

Connect all neighboring cell 1s into a single component, subtract the number of neighbors from `count`, and change the value of cell 1 in the grid to 0.

At the end of the traversal, `count` contains the number of islands.

Reset | Show Solution | Submit

Try it yourself

Implement your solution in `NoOfIslands.java` in the following coding playground. You will need the provided supporting code to implement your solution.

NoOfIslands.java

UnionFind.java

```java
import java.util.*;

class NoOfIslands {
    public static int numIslands(ArrayList<ArrayList<Character>> grid) {
        // Your code will replace this placeholder return statement
        return -1;
    }
}

```

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Submit

Test Cases | Results

Case 1 | Case 2 | Case 3

Input #1

[["1","1","1"],["0","1","0"],["1","0","0"],["1","0","1"]]

Number of Islands

Back

Solution: Redundant C...

Next

Solution: Number of Is...

Mark as Completed