Difficulty: **Category:** **Successful Submissions:** 40,445+

River Sizes

You're given a two-dimensional array (a matrix) of potentially unequal height and width containing only `0`s and `1`s. Each `0` represents land, and each `1` represents part of a river. A river consists of any number of `1`s that are either horizontally or vertically adjacent (but not diagonally adjacent). The number of adjacent `1`s forming a river determine its size.

Note that a river can twist. In other words, it doesn't have to be a straight vertical line or a straight horizontal line; it can be L-shaped, for example.

Write a function that returns an array of the sizes of all rivers represented in the input matrix. The sizes don't need to be in any particular order.

Sample Input

```
matrix = [
  [1, 0, 0, 1, 0],
  [1, 0, 1, 0, 0],
  [0, 0, 1, 0, 1],
  [1, 0, 1, 0, 1],
  [1, 0, 1, 1, 0],
]
```

Sample Output

```
[1, 2, 2, 2, 5] // The numbers could be ordered differently.

// The rivers can be clearly seen here:
// [
//   [1,  ,  , 1,  ],
//   [1,  , 1,  ,  ],
//   [ ,  , 1,  , 1],
//   [1,  , 1,  , 1],
//   [1,  , 1, 1,  ],
// ]
```

Hints

Hint 1

Hint 2

Hint 3

Optimal Space & Time Complexity