

Last Day Where You Can Still Cross

Try to solve the Last Day Where You Can Still Cross problem.

We'll cover the following ^

- Statement
- Examples
- Understand the problem
- Figure it out!
- Try it yourself

Statement

You are given two integers, `rows` and `cols`, which represent the number of rows and columns in a 1-based binary matrix. In this matrix, each 0 represents land, and each 1 represents water.

Initially, on day 0, the whole matrix will just be all 0s, that is, all land. With each passing day, one of the cells of this matrix will get flooded and, therefore, will change to water, that is, from 0 to 1. This continues until the entire matrix is flooded. You are given a 1-based array, `waterCells`, that records which cell will be flooded on each day. Each element $waterCells[i] = [r_i, c_i]$ indicates the cell present at the r_i^{th} row and c_i^{th} column of the matrix that will change from land to water on the i^{th} day.

We can cross any cell of the matrix as long as it's land. Once it changes to water, we can't cross it. To cross any cell, we can only move in one of the four cardinal directions. Given the number of rows and columns of a 1-based binary matrix and a 1-based array, `waterCells`, you are required to find the last day where you can still cross the matrix, from top to bottom, by walking over the land cells only.

Note: You can start from any cell in the top row, and you need to be able to reach just one cell in the bottom row for it to count as a crossing.

Constraints:

- $2 \leq rows, cols \leq 2 \times 10^4$
- $4 \leq rows \times cols \leq 2 \times 10^4$
- `waterCells.length == rows × cols`
- $1 \leq r_i \leq rows$
- $1 \leq c_i \leq cols$
- All values of `waterCells` are unique.

Examples

Sample example 1

Cells: [[1, 2], [2, 1], [3, 3], [2, 2], [1, 1], [1, 3], [2, 3], [3, 2], [3, 1]]

0	0	0
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0	0	0
0	0	0

Initially the whole grid is land, we'll check for every day whether we can travel from top to bottom by walking only on land cells.

1 of 6

Sample example 1

Cells: [[1, 2], [2, 1], [3, 3], [2, 2], [1, 1], [1, 3], [2, 3], [3, 2], [3, 1]]

0	1	0
0	0	0
0	0	0

On first day, we can travel from top to bottom row.

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Sample example 1

Cells: [[1, 2], [2, 1], [3, 3], [2, 2], [1, 1], [1, 3], [2, 3], [3, 2], [3, 1]]

0	1	0
1	0	0
0	0	0

On second day, we can travel from top to bottom row.

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Sample example 1

Cells: [[1, 2], [2, 1], [3, 3], [2, 2], [1, 1], [1, 3], [2, 3], [3, 2], [3, 1]]

0	1	0
1	0	0
0	0	1

On third day, we can travel from top to bottom row.

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Sample example 1

Cells: `[[1, 2], [2, 1], [3, 3], [2, 2], [1, 1], [1, 3], [2, 3], [3, 2], [3, 1]]`

0	1	0
1	1	0
0	0	1

On fourth day, we cannot move from top to bottom row. So 3 was the last day when we could travel from top to bottom row.

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Sample example 2

Cells: `[[2,1], [3, 3], [1, 1], [1, 3], [3, 4], [3, 1], [1, 2], [3, 2], [2, 2], [1, 4], [2, 3], [2, 4]]`

1	1	1	0
1	0	0	0
1	1	1	1

On eighth day, we cannot move from top to bottom row. So 7 was the last day when we could travel from top to bottom row.

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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:

Last Day Where You Can Still Cross

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Given these values as input, which matrix represents the state of the matrix on day 4?

Note: In the options, 1 represents water.

rows = 3

cols = 3

waterCells = `[[3, 2], [1, 3], [2, 2], [3, 1], [1, 1], [1, 2], [2, 3], [3, 3], [2, 1]]`

| 0 | 0 | 0 |

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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.

Initialize a variable `days` to keep track of the number of days starting with 0 and a matrix of dimensions, `rows × cols`, containing all 0s in the start (all land on day 0).

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Start filling the matrix with water cells, as per the given `waterCells` array.

Each time a cell is flooded, check if it can connect with any existing water cells.

After connecting the recently added water cell to the existing water cells, check if we get a single connected component of water cells from the leftmost to the rightmost side of the matrix.

If there exists a series of connected water cells, we'll stop here and return the current value of the `days` variable as the final output.

Otherwise, we can still cross the matrix from top to bottom. Therefore, increment the value of `days` and repeat the process for the next cell to be flooded.

Reset

Show Solution

Submit

Try it yourself

Implement your solution in `LastDayToCross.java` in the following coding playground. You'll need the provided supporting code to implement your solution.



LastDayToCross.java

UnionFind.java

```
1 import java.util.*;
2
3 class LastDayToCross {
4
5     public static int lastDayToCross(int rows, int cols, int[][] waterCells)
6
7         // replace this placeholder return statement with your code
8         return -1;
9     }
10
11 }
```





Submit

Test Cases Results

Case 1

Case 2

Case 3

Input #1

2

Input #2

2

Input #3

[[1,1],[1,2],[2,1],[2,2]]

Last Day Where You Can Still Cross

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Solution: Number of Is...

Solution: Last Day Wh...

☒ Mark as
Completed

