# **Bacteria**(Easy)

#### **Problem**

A number of bacteria lie on an infinite grid of cells, each bacterium in its own cell.

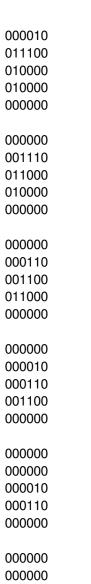
Each second, the following transformations occur (all simultaneously):

- 1. If a bacterium has no neighbor to its north and no neighbor to its west, then it will die.
- 2. If a cell has no bacterium in it, but there are bacteria in the neighboring cells to the north and to the west, then a new bacterium will be born in that cell.

Upon examining the grid, you note that there are a positive, finite number of bacteria in one or more rectangular regions of cells.

Determine how many seconds will pass before all the bacteria die.

Here is an example of a grid that starts with 6 cells containing bacteria, and takes 6 seconds for all the bacteria to die. '1's represent cells with bacteria, and '0's represent cells without bacteria.



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### Input

The input consists of:

• One line containing C, the number of test cases.

Then for each test case:

- One line containing **R**, the number of rectangles of cells that initially contain bacteria.
- **R** lines containing four space-separated integers **X**<sub>1</sub> **Y**<sub>1</sub> **X**<sub>2</sub> **Y**<sub>2</sub>. This indicates that all the cells with X coordinate between X<sub>1</sub> and X<sub>2</sub>, inclusive, and Y coordinate between Y<sub>1</sub> and Y<sub>2</sub>, inclusive, contain bacteria.

The rectangles may overlap.

North is in the direction of decreasing Y coordinate. West is in the direction of decreasing X coordinate.

### **Output**

For each test case, output one line containing "Case #N: T", where N is the case number (starting from 1), and T is the number of seconds until the bacteria all die.

#### Limits

 $1 \le \mathbf{C} \le 100$ .

#### dataset

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1 \le R \le 10

1 \le X_1 \le X_2 \le 100

1 \le Y_1 \le Y_2 \le 100
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The number of cells initially containing bacteria will be at most 1000000.

## Sample

Input Output

3 5 1 5 1 Case #1: 6

2 2 4 2 2 3 2 4