Problem A

Grandpa's Walk

In spite of his old age, Grandpa Pierre likes to take a walk. He believes that by taking more exercises, he will be healthy and live a longer life. The area which Grandpa used to explore can be represented as a N x M map, where each cell contains the height information of that area. Grandpa can start from any cell and walk from a cell to its adjacent cells (north, south, west, east) if and only if the destination cell's height is strictly lower than his current cell's height.

For example, consider a 4 x 5 map below.

1	5	3	2	2
4	4	2	1	7
10	9	6	8	5
2	1	5	3	4

Figure 1

There are many possible routes, for example:

1	5	3	2	2
4	4	**2**	1	7
10	**9**	**6**	8	5
2	1	5	3	4

Figure 2

1	5	3	2	2
4	4	2	1	7
10	9	**6**	8	5
2	**1**	**5**	3	4

Figure 3

1	5	3	2	2
4	4	2	1	**7**
10	9	6	8	**5**
2	1	5	**3**	**4**

Figure 4

- Figure 2 shows a route of length 4 which starts from a cell with height 10 and ends at a cell with height 2 (10 - 9 - 6 - 2).
- Figure 3 shows a route of length 3 which starts from a cell with height 6 and ends at a cell with height 1 (6 - 5 - 1).
- Figure 4 shows a route of length 4 which starts from a cell with height 7 and ends at a cell with height 3 (7 - 5 - 4 - 3)

There are many other routes we can get from Figure 1 which are not shown.

A route is considered maximal if and only if one cannot extend the route at the beginning or at the end to make it a longer route.

- Figure 2 is not a maximal route. We can extend the end of the route from cell with height 2 to its east, a cell with height 1, such that the route is 10 - 9 - 6 - 2 - 1 with length of 5.
- Figure 3 is not a maximal route. We can extend the beginning of the route from cell with height 6 to its east, a cell with height 8, such that the route is 8 - 6 - 5 - 1 with length of 4.
- Figure 4 corresponds to a maximal route because we can extend neither the beginning nor the end of the route.

Your task is to help Grandpa Pierre to count how many maximal routes there are in the given map.

Input

The first line of input contains an integer T (T ≤ 100) denoting the number of cases. Each case begins with two integers N and M (1 ≤ N, M ≤ 50) denoting the number of rows and columns in the map respectively. The next N lines each contains M integers A_{ij} (1 ≤ A_{ij} ≤ 100) denoting the height of a cell in i^{th} row and j^{th} column.

Output

For each case, output "`Case #X: Y`", where `X` is case number starts from 1 and `Y` is the number of maximal route we can find in the given map such that the route visits cells in strictly decreasing height order.

Sample Input	Output for Sample Input
4 4 5 1 5 3 2 2 4 4 2 1 7 10 9 6 8 5 2 1 5 3 4 3 4 8 8 8 8 8 8 8 8 8 8 8 8 2 5 2 1 6 7 8 6 7 1 4 5 1 10 4 3 2 1 2 3 4 5 6 7	Case #1: 20 Case #2: 12 Case #3: 7 Case #4: 2

Explanation for 2nd sample input.

All cells have the same height, so there are only routes with length 1, and there are 12 of them.

Explanation for 3rd sample input.

List of visited cells' height of all maximal routes are:

1. 7 - 1
2. 7 - 1
3. 7 - 6 - 2 - 1
4. 8 - 5 - 4 - 1
5. 8 - 7 - 4 - 1
6. 8 - 7 - 6 - 1
7. 8 - 7 - 6 – 1

Notice there are two (7 - 1) above and both are different routes. The first one corresponds to a route from cell (1, 1) to cell (0, 1), while the second one is from cell (1, 1) to cell (1, 2). A same explanation applies for (8 - 7 - 6 - 1).