

Football Team

Problem

A football team will be standing in rows to have a photograph taken. The location of each player will be given by two integers x and y , where y gives the number of the row, and x gives the distance of the player from the left edge of the row. The x values will be all different.

In order to make the photo more interesting, you're going to make sure players who are near each other have shirts of different colors. To do this, you set the following rule:

For each player P :

- The closest player to the right of P in the same row, if there is such a player, must have a different shirt color.
- The closest player to the right of P in the previous row, if there is such a player, must have a different shirt color.
- The closest player to the right of P in the next row, if there is such a player, must have a different shirt color.

More formally, if there is a player at (x_1, y_1) and (x_2, y_2) , where $x_1 < x_2$, then those two players must have different shirt colors if:

- $y_1 - 1 \leq y_2 \leq y_1 + 1$, and
- there is no x_3 such that there is a player at (x_3, y_2) and $x_1 < x_3 < x_2$.

Find the minimum number of distinct shirt colors required so that this is possible.

Input

The first line of input contains a single integer T , the number of test cases. Each test case starts with a line that contains an integer N , the number of players, followed by N lines of the form

$x \ y$

each specifying the position of one player.

Output

For each test case, output

Case # X : c

where X is the test case number, starting from 1, and c is the minimum number of colors required.

Limits

Time limit: 30 seconds per test set.

Memory limit: 1 GB.

$1 \leq T \leq 100$

$1 \leq x \leq 1000$

The values of x will all be different.

Small dataset

$$1 \leq y \leq 15$$

$$1 \leq N \leq 100$$

Large dataset

$$1 \leq y \leq 30$$

$$1 \leq N \leq 1000$$

Sample

Sample Input

```
3
3
10 10
8 15
12 7
5
1 1
2 1
3 1
4 1
5 1
3
1 1
2 2
3 1
```

Sample Output

```
Case #1: 1
Case #2: 2
Case #3: 3
```