Problem 242: Website Layout

Difficulty: Hard

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Problem Background

Congratulations! You've been hired for an internship with Lockheed Martin Code Quest! Your first assignment is to work on some updates for the Code Quest Academy website. We need your help laying out some elements to be added to a new version of the home page to determine if the layout can be easily displayed on a mobile device.

Problem Description

Each of the elements to be added to the webpage has the same height but have differing widths and must be positioned at differing offsets from the left edge of the screen. For example, the image below shows three elements:

- A gray element with a width of 10 pixels and an offset of 20 pixels,
- A white element with a width of 30 pixels and an offset of 10 pixels, and
- A black element with a width of 20 pixels and an offset of 30 pixels

Clearly, the white element would overlap the other two if they were placed with the same vertical offset – that is, in the same row. The gray and black elements can be comfortably placed side-by-side, but the white element must be placed above or below them to be able to see all three elements in their entirety.

Given a list of elements identified by their widths and offsets from the left edge, you need to determine the minimum number of rows needed to fully display all of those elements without overlapping. The width of your screen is unlimited; while we're hoping to get this to display on a mobile device, we're testing several layouts and don't actually expect all of them to work.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A line containing a single positive integer, N, indicating the number of elements to be added to the webpage

- N lines, each containing two non-negative integers separated by a space, representing respectively:
    - The left offset of an element in pixels
    - The width of that element in pixels

```
2
3
20 10
10 30
30 20
5
10 20
20 30
30 40
40 50
50 60
```

Sample Output

For each test case, your program must print a single line containing an integer representing the minimum number of rows required to fully display all elements described in the test case.

```
2
3
```