Problem M. Mountains on Histograms

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	1024 mebibytes

We want to draw a picture in the shape of a histogram by repeatedly coloring mountains on a histogram-shaped canvas.

A histogram is defined as a shape consisting of one or more rectangles that share a common base and are placed next to each other without gaps, with the base parallel to the x-axis. The width and height of each rectangle are integers and can be different from each other.

A single mountain coloring is performed as follows:

- Choose a point on the top edge of the canvas as the peak of the mountain.
- Color the **largest** possible mountain shape that fits that peak.

The mountain cannot extend beyond the canvas, and previous colorings do not affect the current coloring. Additionally, the left or right end of a rectangle cannot be the peak of the mountain.

The specific definition of a mountain is as follows:

- The left part that includes the peak has heights that are monotonically increasing.
- The right part that includes the peak has heights that are monotonically decreasing.

Here, a function f is said to be monotonically increasing if it satisfies $f(x_1) \le f(x_2)$ for all $x_1 < x_2$, and it is said to be monotonically decreasing if it satisfies $f(x_1) \ge f(x_2)$ for all $x_1 < x_2$.

In other words, after we choose a peak, we color all points reachable on the canvas by moving down, left, and right from the peak.

If it is possible to draw the given picture by repeatedly coloring mountains, do so with the minimum number of colorings; if it is not possible, output -1.

Input

The first line contains the number of rectangles n that make up the histogram of the canvas ($1 \le n \le 2 \cdot 10^5$).

Each of the next n lines contains two integers w_i and h_i: the width and height of each rectangle of the canvas ($1 \le w_i, h_i \le 10^9$).

The next line contains the number of rectangles m that make up the histogram of the picture ($1 \le m \le 2 \cdot 10^5$).

Each of the next m lines contains two integers w'_j and h'_j: the width and height of each rectangle of the picture ($1 \le w'_j, h'_j \le 10^9$).

The following guarantees hold:

- The total width of the canvas and the picture is the same and does not exceed 10^9: $\sum w_i = \sum w'_j \le 10^9$.
- The canvas contains the picture.
- Adjacent rectangles have different heights: $h_i \ne h_{i+1}$ and $h'_j \ne h'_{j+1}$.

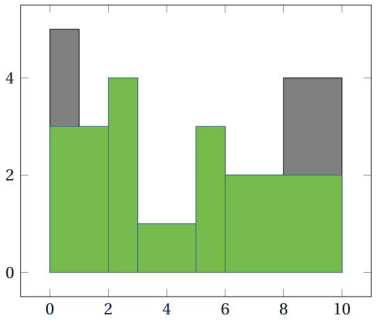
Output

Output the minimum number of mountain colorings required on the first line. If it is not possible to complete the picture, output -1 and terminate.

On the second line, output the indices of the rectangles on the **canvas** that contain the peak of the mountain for each coloring, separated by spaces.

If there are multiple valid answers, print any one of them.

Examples

standard input	*standard output*	Notes
7 1 5 1 3 1 4 2 1 1 3 2 2 2 4 5 2 3 1 4 2 1 1 3 4 2	2 3 5	
2 4 5 4 7 2 4 5 4 6	-1