# H - Happy 2015

Time limit : 2sec / Memory limit : 512MB

## Problem

As the end of year $2015$ approaching, the downtown area has been lighted up to celebrate year's end. At this year, Cat Snuke also enjoys making a light-up device for the downtown area.

The downtown can be regarded as a one-dimensional line of numbers. There are $N$ lights that have been installed on this number line. When the power of the $i_{th}$ light is on, it can illuminate an interval of $[l_i,r_i]$ (inclusive).

Although Cat Snuke can switch on the $N$ lights independently as his wish, he wants to try different illumination combinations as many as possible. Then, if we had tried all the combinations of $2^N$ illumination combinations, we want to know how many different illumination combinations there are, of which each combination is a set of points that for each point in it can be illuminated by one or more lights.

When we tried all the $2^N$ illumination combination, please answer the number of the different illumination combinations, modulo $1,000,000,007$.

## Input

Inputs will be given by standard input in following format

$$
\begin{array}{ll}
N & \\
l_1 & r_1 \\
l_2 & r_2 \\
: & \\
l_N & r_N
\end{array}
$$

- At the first line, an integer $N(1 \leqq N \leqq 2,000)$ will be given divided by a space.
- From the second line there are $N$ additional lines to give the information about the illumination range. For the $i_{th}$ line, integer $l_i$, $r_i(0 \leqq l_i < r_i \leqq 1,000,000,000)$ will be given divided by a space.

## Output

Please answer the number of the different illumination combinations, modulo $1,000,000,007$.

Print a newline at the end of output.

### Input Example 1

```
4
0 1
1 2
0 2
1 3
```

### Output Example 1

```
6
```

There are $16$ different ways of attaching the light power, but there are only $6$ different illumination combinations, $\{\varphi\},\{[0,1]\},\{[1,2]\},\{[0,2]\},\{[1,3]\},\{[0,3]\}$.

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### Input Example 2

```
12
0 4
7 12
1 3
6 8
2 3
4 6
8 9
2 7
9 11
1 2
3 5
7 9
```

### Output Example 2

```
240
```

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### Input Example 3

```
14
0 1
2 3
4 5
6 7
8 9
10 11
12 13
14 15
16 17
```

```
18 19
0 3
4 7
8 13
14 19
```

## Output Example 3

```
2025
```

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