

British Informatics Olympiad Final
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Home on the Range — Part One

The ‘Range’, with its cloudless skies and convenient access to the glittering stars, would be an ideal place to visit were it not for the dangers of roaming buffalo, frolicking antelope and rascally deer. Fortunately many surveys have been done to determine which parts are safe and trampling injuries are decreasing steadily.

Given a list of safe sections, your task is to determine where the i^{th} safe unit of land lies. Positions on the range have been measured using a sophisticated ‘Global Positioning System’ and are all integers. Note that, since the surveys were carried out by independent contractors, some of the indicated ‘safe’ sections overlap; a piece of land included in more than one survey is only counted once.

For example, if the safe sections (all inclusive) are 1–1000, 4000–5000 and 3800–4300 the 1st safe unit is at position 1, the 1001st is at 3800 and the 1301st is at 4100.

The first line of the input file will consist of a single integer, n ($1 \leq n \leq 5000$), indicating the number of sections which are to follow. The next n lines will each contain two numbers, s then e ($0 < s \leq e < 2^{30}$), indicating the start and end of a range. *All ranges are inclusive, i.e. include both the start and end points.* The next line will consist of a single integer, i ($1 \leq i \leq 2^{30}$).

You should output a single integer, indicating the value of the i^{th} safe unit of land (or -1 if you believe there are fewer than i units of safe land).

Sample Input

```
3
1 1000
4000 5000
3800 4300
1234
```

Sample Output

```
4033
```