# Problem 4 – Nested Rectangles

We are given **N rectangles** in the 2D plane. Rectangles’ sides are horizontal and vertical only. A rectangle FA is **nested** inside another rectangle FB if the entire area of FA is inside the rectangle FB. We denote this as **FA < FB**. Find the **longest sequence of rectangles F1 < F2 < ... < FK**. If several longest sequences exist, find the **first in the alphabetical order**.

### Input

* The input data comes from the console. It consists of sequence of lines holding rectangles, ending with “**End**”.
* Each rectangle comes in format “**name: left top right bottom**” (**left** < **right**, **top** > **bottom**).

### Output

* Print at the console the longest sequence of nested rectangles in format “**name1 < name2 < …**”.
* If several longest sequences exist, print the **first in the alphabetical order**.

### Constraints

* The **number of rectangles** is in the range **[1 … 1 000]**.
* **Rectangle names** consist of Latin letters and digits and are case-sensitive. Duplicated names are not allowed.
* All **coordinates** (**top**, **left**, **right** and **bottom**) are integers in the range **[-100 000 … 100 000]**.
* There are no repeating (duplicated) rectangles with the same coordinates.
* Time limit: **150 ms**. Allowed memory: **24 MB**.

### Examples

|  |  |
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| **Input** | **Visualization** |
| Theta: -30 40 55 -10  Delta: -40 30 -20 10  Alpha: -60 50 40 -20  Zeta: -50 30 -20 0  Beta: -10 30 20 0  Gamma: -40 40 60 -35  End |  |
| **Output** |
| Alpha < Zeta < Delta |
| **Comments** |
| Two longest sequences of nested rectangles of the same length 3:   * Gamma < Theta < Beta * Alpha < Zeta < Delta   The first in the alphabetical order is:   * Alpha < Zeta < Delta |
| **Input** | **Visualization** |
| Europe: 0 60 70 0  Italy: 5 30 30 20  Austria: 35 20 60 10  France: 35 40 60 30  Alps: 20 50 50 15  End |  |
| **Output** |
| Europe < Alps |