

Problem 4 – Nested Rectangles

We are given **N rectangles** in the 2D plane. Rectangles' sides are horizontal and vertical only. A rectangle F_A is **nested** inside another rectangle F_B if the entire area of F_A is inside the rectangle F_B . We denote this as $F_A < F_B$. Find the **longest sequence of rectangles** $F_1 < F_2 < \dots < F_k$. 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).

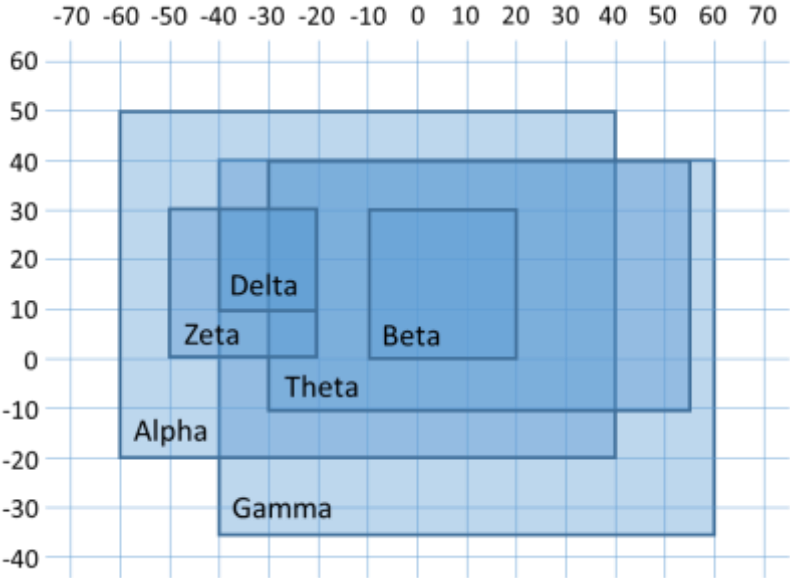
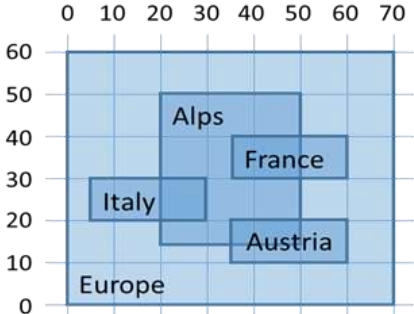
Output

- 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

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: <ul style="list-style-type: none"> Gamma < Theta < Beta Alpha < Zeta < Delta The first in the alphabetical order is: <ul style="list-style-type: none"> 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	