G: Star Rectangles

Gregory loves both astronomy and geometry, so he has been plotting stars on a 2-dimensional map. He wants to make the largest rectangle he can from the stars on his map, using a star at each corner, but there are just too many stars for him to solve this task by hand! You have been referred to Gregory as a programming genius who can solve his problem. Gregory has M maps, each with N different stars at coordinates X and Y. His rectangles are always parallel to the x and y axes.

Input

Input begins with the number of maps M ($M \leq 5$). Each map will begin with N ($1 \leq N \leq 100$), the number of stars, on a line by itself. This is followed by N lines containing the X and Y integer coordinates of the stars, each separated by a space. X and Y will be in the range ($-1000 \leq X, Y \leq 1000$).

Output

For each map, print out the coordinates that comprise the four corners of the largest rectangle in sorted order (sort by X, then sort by Y). If more than one largest rectangle can be found, print the one occurring first in sorted order (sort by X, then sort by Y). Your output should follow the exact format shown in the sample output below. If a rectangle cannot be made, print "NONE" on the output line.

Sample Input

```
2
7
-5 5
5 5
-5 0
5 0
0 0
0 11
5 11
7
-5 5
5 5
-5 0
5 0
0 0
0 10
5 10
```

Sample Output

```
(0,0),(0,11),(5,0),(5,11)
(-5,0),(-5,5),(5,0),(5,5)
```