
Rectangles (2)**P82952_en**

Using the definitions and procedures of the exercise **RECT1** that you need, your task is to write a program that reads a series of sequences of rectangles, and for each one prints the final result of their intersection.

Input

Input consists of several sequence of rectangles. Each sequence starts with a natural strictly positive n , followed by the description of n rectangles (four integer numbers each one). A special sequence with $n = 0$ indicates the end of the input.

Output

For each sequence of rectangles, print the final result of their intersection following the format of the instance. If the intersection is empty (that is, if has area zero), print “empty intersection”.

Sample input 1

```
3
0 10 0 10
2 4 2 4
3 5 3 5
2
-10 -5 0 5
-4 -2 2 3
1
1 2 3 4
2
0 1 0 1
1 2 0 1
0
```

Sample output 1

```
bottom left point = (3, 3); top right point = (4, 4)
empty intersection
bottom left point = (1, 3); top right point = (2, 4)
empty intersection
```

Problem information

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