



# Practice Arena

Practice problems aimed to improve your coding skills.

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# Recover the Rectangle

## LAB-PRAC-12\_FUN-STRUC

**Recover the Rectangle [20 marks]**

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**Problem Statement**

Mr C had drawn a nice axis-aligned rectangle (i.e. whose sides are parallel either to the x or the y axis) on a piece of paper and decorated his drawing with a few dots. However, one of his mischievous clones came and erased the lines forming the edges of the rectangle leaving only the dots for the corners behind. Help Mr C recover his nice rectangle.

The first line of the input will give you  $n$ , a strictly positive number, giving you the number of points on the plane. In the next  $n$  lines, we will give you the  $x$  and  $y$  coordinates of  $n$  points on the 2D plane, separated by a space. The coordinates will all be integers. In your output, you have to print the area of the largest axis-aligned rectangle that can be formed out of the  $n$  points we have given you. If no axis-aligned rectangle can be formed out of the points we have given you, simply print  $-1$  in the output.

**Caution**

1. Rest assured that we will give you at least 4 points i.e.  $n$  will be greater than or equal to 4.
2. The rectangle we are looking for has non-zero area. Please do not report a single point as a rectangle of area zero. If there is no axis-aligned rectangle of non-zero area, you should print  $-1$  as your output.
3. The rectangle we are looking for must be axis aligned. Do not report a rectangle whose sides are not parallel to the  $x$  and  $y$  axes.
4. Be careful about extra/missing lines and extra/missing spaces in your output.

**HINTS:** An axis-aligned rectangle, as we discussed in class, is always uniquely identified using its lower left corner and its upper right corner. You may also want to use a structure to store the points and use an array of these structure variables to process the points given to you.

```
struct Point{
    int x,y;
};
struct Point points[n];
```

---

**EXAMPLE:**

INPUT

```
9
1 1
1 2
1 3
2 1
2 2
2 3
3 1
3 2
3 3
```

OUTPUT:

4

**Explanation:** the points (1,1) (1,3) (3,1) (3,3) form a rectangle of area 4.

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**Grading Scheme:**

Total marks: **[20 Points]**

There will be no partial grading in this question. An exact match will receive full marks whereas an incomplete match will receive 0 points. Please be careful of missing/extra spaces and missing/lines (take help of visible test cases). Each visible test case is worth 1 point and each hidden test case is worth 2 points. There are 2 visible and 4 hidden test cases.

 **Start Solving!** (/editor/practice/6237)