

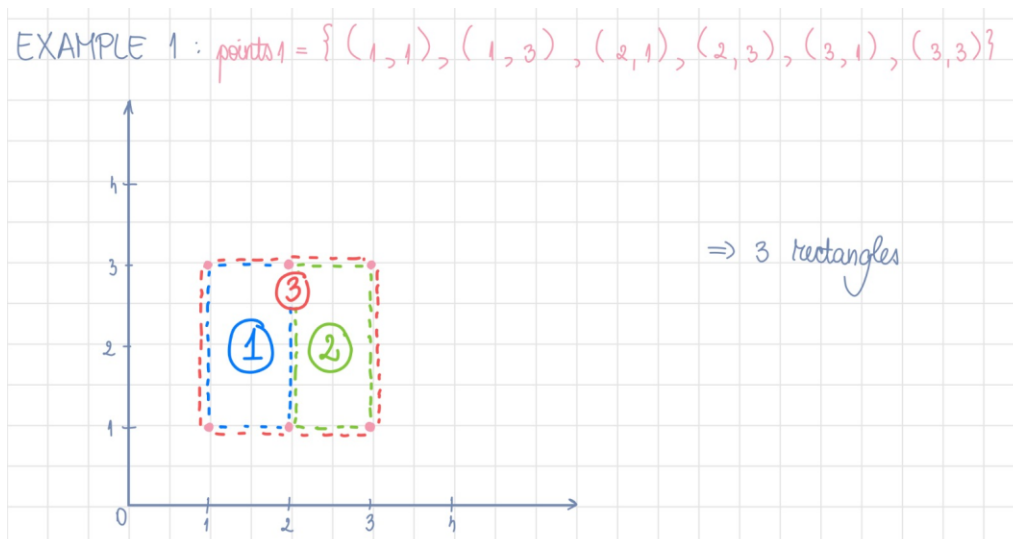
Rectangle problem

- We suppose that the points are given in a vector of pairs.
- The approach we will use: for 2 points from the given vector of points, let's say $P1(x1, y1)$ and $P2(x2, y2)$, if $x1 \neq x2$ and $y1 \neq y2$, it means that the points can form a diagonal of a rectangle, and we must check if the points $P3(x1, y2)$ and $P4(x2, y1)$ also exist in the vector.
- By using this approach we will find only the rectangles that are parallel with the X and Y axes.

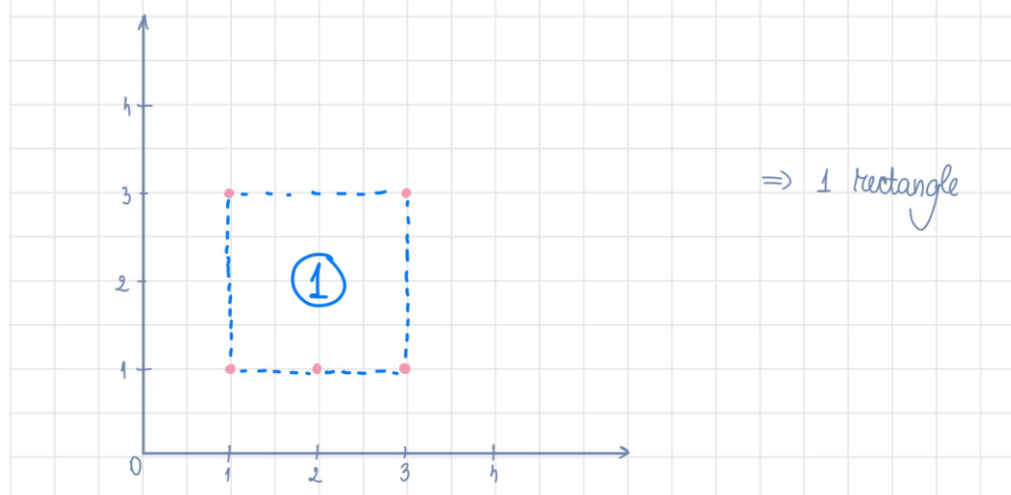
Algorithm:

- For an efficient search of the points, we will put the points in a set.
- We initialize a variable "rectangles" with 0, where we will store the number of possible rectangles.
- We will take the points two by two and we check if they can form a diagonal of a rectangle (i.e. we take the points $(x1, y1)$ and $(x2, y2) \Rightarrow$ they can form a diagonal if $x1 \neq x2$ and $y1 \neq y2$).
- If the points can form a diagonal, we will search in the set of points, the other two points of the rectangle (i.e. we will search for the points $(x1, y2)$ and $(x2, y1)$).
- If the points are present in the set of points, we will increase the answer variable "rectangles".
- By using this approach, we will find both diagonals of a rectangle and in the answer variable, one rectangle will be stored two times, so, at the end we will divide the answer by two and we will obtain the correct answer.

Examples:



EXAMPLE 2 : $\text{points}_2 = \{(1,1), (1,3), (2,1), (3,1), (3,3)\}$



EXAMPLE 3 : $\text{points}_3 = \{(1,1), (1,2), (2,1), (3,3)\}$

