

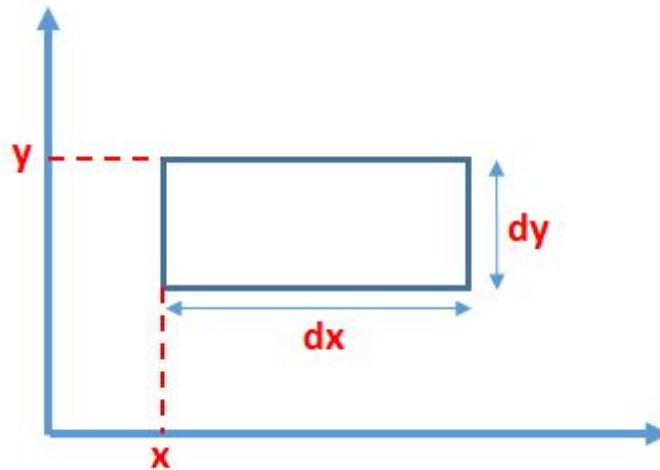
Home exercise for Intel sports -DL&CV Student candidates

Intro:

- This exercise presents a simple algorithmic problem (see problem description section).
- Please read and follow the instructions in the “submission requirements” section.
- You will be evaluated based on your solution correctness and simplicity, as well as coding standards and reasonable division of the problem into different modules.

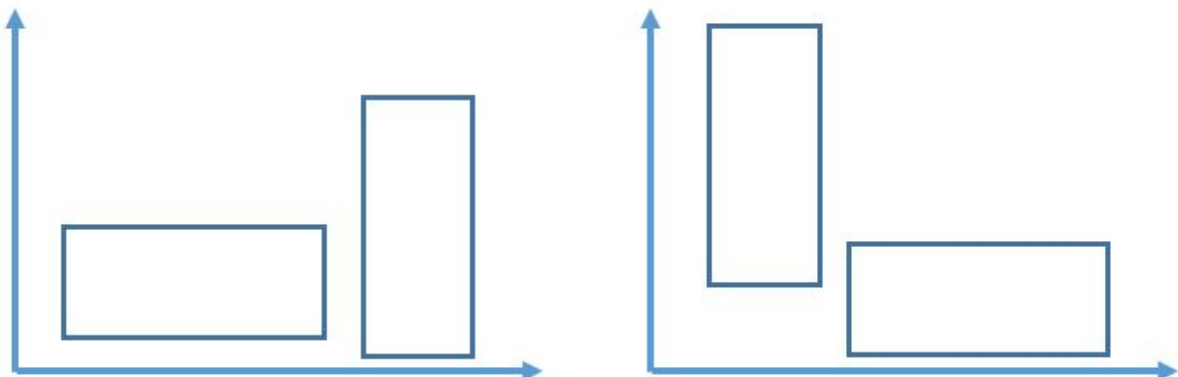
Problem description:

- We define a rectangle in 2d space as follows: (x, y, dx, dy) , where x and y are the coordinates of the top left corner, and dx and dy are the rectangle's width and height. See illustration below.

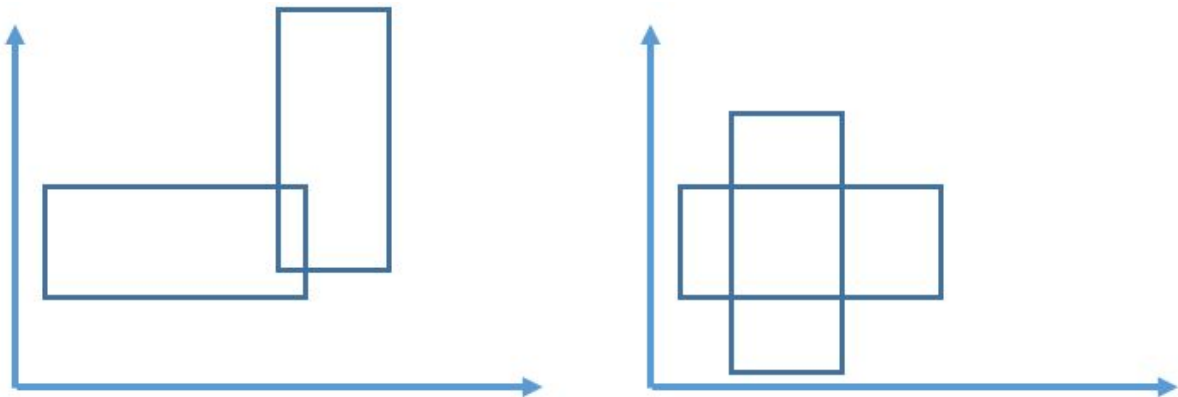


- All four numbers (x, y, dx, dy) are **integers**.
- The core problem to be solved is: given 2 rectangles, decide whether they intersect or not (see examples below).

Non-intersecting rectangles:



Intersecting rectangles:



- **Your code should work as follows:**
 - Your input is a text file (named “rectangles.txt”) provided with this exercise.
 - The text file contains N lines. Each line represents a single rectangle as defined above. The values in each line are **space-separated**.
 - Your code should read the file, and for each line (rectangle) count the number of rectangles in the file that intersect with it (not including itself).
 - As output, your code should create and save a text file named “rectangles_count.txt” which is identical to the input file, but with an additional value at the end of each line - the number of intersections of that rectangle.
 - Input line format: x y dx dy
 - Corresponding output line format: x y dx dy num_intersections

Submission requirements:

- Solution in Python only.
- You should submit a single Python file named “count_intersections.py”, and the output text file generated by running your code on the provided text file.
- You are free to design your solution and code as you see fit.
- All functions should be well documented. (pseudo would be appreciated, but not must if code is self explanatory)
- you can use vanilla python and numpy libraries only