Problem K. Keras-WPOD-NET

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	128 megabytes

Currently, Vu is a final year student, Vu has registered for the subject "Major Internship" — The prerequisite subject for the "Graduation Project" helps Vu graduate next semester. This subject requires a combination of skills from many other subjects that Vu has studied. Vu and his group of friends registered for the topic "Automatic license plate recognition system using deep learning model".

With the knowledge and experience gained, Team Vu started working and achieved certain achievements. The research team detected license plates with very high accuracy. Unfortunately, the recognized license plate image is not rectangular, making character recognition difficult.

Example of License plate image is not rectangular

Fortunately, Vu discovered the deep learning model WPOD-NET. This model can convert an image containing a deformed flat object into a complete rectangle. But this model requires the original dimensions of the vehicle. Currently, Vu only has a photo of the license plate, not the original photo of the car.

Duy, a friend of Vu, came up with the idea of enlarging the image of that license plate n times without changing the size of the original license plate. After expanding the image, the recognition model was able to work well.


Example of WPOD-NET

Image representation coordinates used in machine learning consist of rows (x) and columns as depicted in the image below:
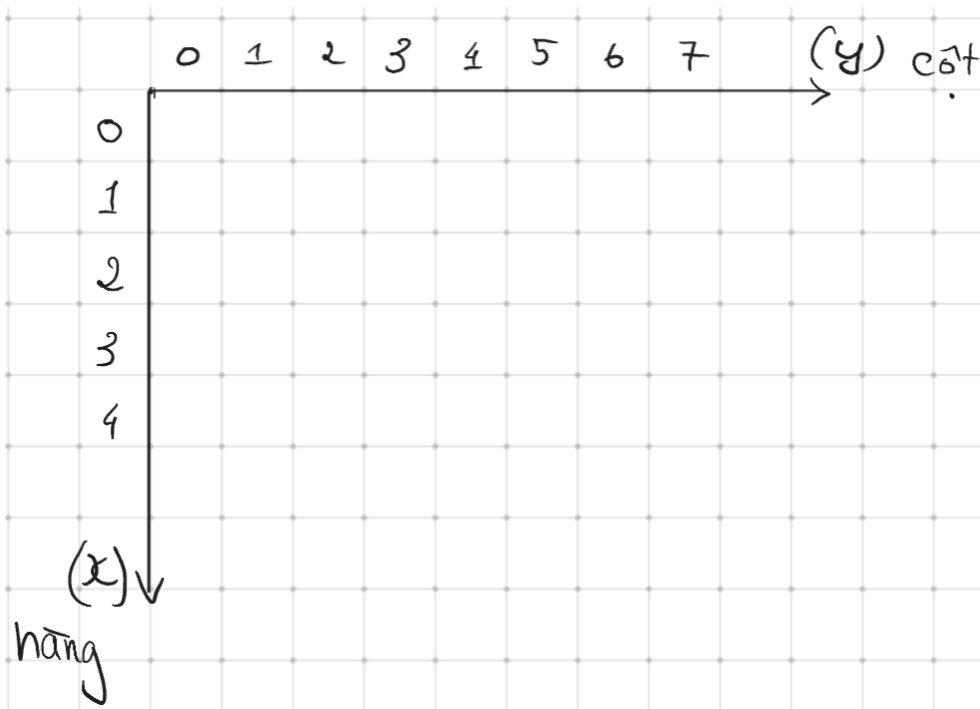
Duy's approach is as follows: First we will find the center point (O) of that shape, Then draw a perpendicular line from the center to the 4 sides of the rectangle, we call them OA, OB, OC, OD respectively. We draw line segments perpendicular to the sides of the rectangle starting from O in turn so that these line segments coincide with OA, OB, OC, OD and are n times larger than them. After performing these steps, we will have a new rectangle expanded from the rectangle containing the old license plate.
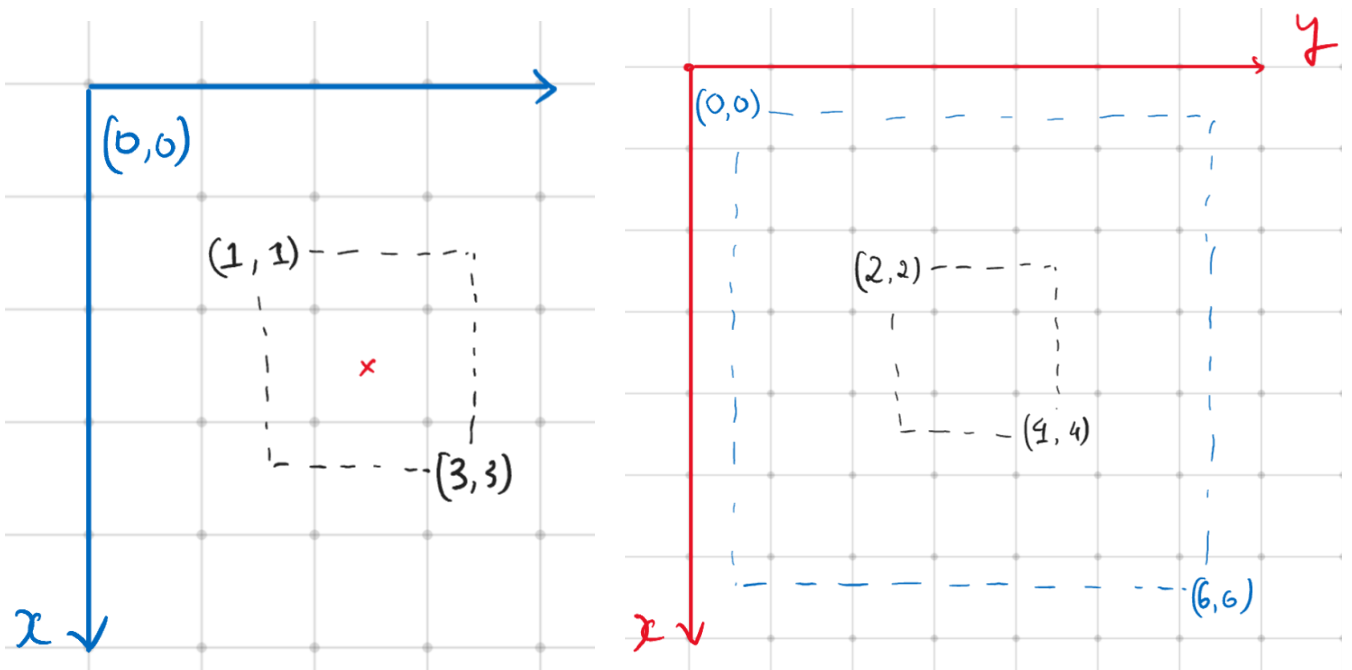
Example of expand image.

The image on the left represents the original license plate, the image on the right represents the license plate after expanding 3 times ($n = 3$). The license plate image is black dashed lines. The blue dashed line represents the new image after being expanded. Write a program to calculate new coordinates after expanding n times.

Input

The input includes 5 values which are integers, $x1$, $y1$, $x2$, $y2$, n ($0 \leq x1 < x2 \leq 100, 0 \leq y1 < y2 \leq 100, 0 < n \leq 100$). $(x1, y1)$ corresponds to the top-left point, $(x2, y2)$ corresponds to the bottom-right point. n corresponds to the number of expansions.

Output

The output includes 8 integer values, $a1$, $b1$, $a2$, $b2$, $p1$, $q1$, $p2$, $q2$. $[a1, b1, a2, b2]$ corresponds top-left, bottom-right coordinates of the license plate when at the new coordinates. $[p1, q1, p2, q2]$ corresponds top-left, bottom-right coordinates of image around the license plate.

Example

standard input	standard output
1 1 3 3 3	2 2 4 4 0 0 6 6

Note

p1, q1 start from $(0, 0)$