

UNIVERSITÉ DE GENÈVE

IMAGERIE NUMÉRIQUE

13X004

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## TP 5: Geometric transformations

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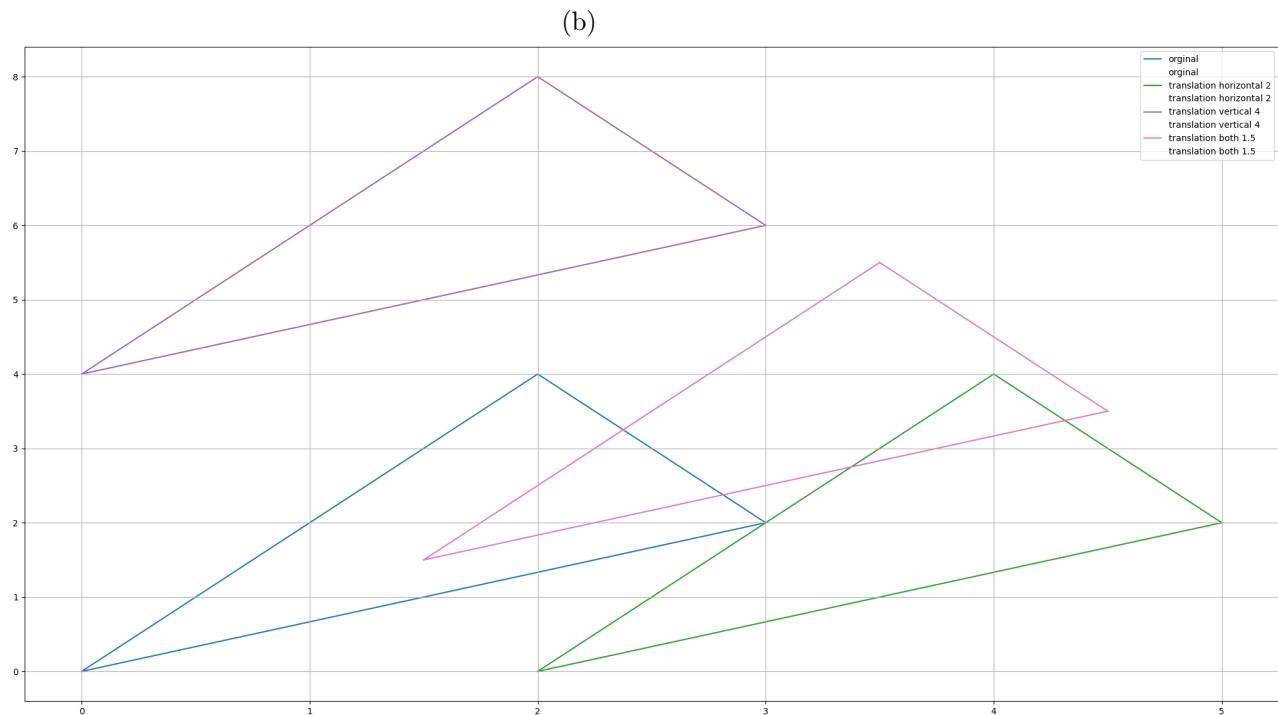
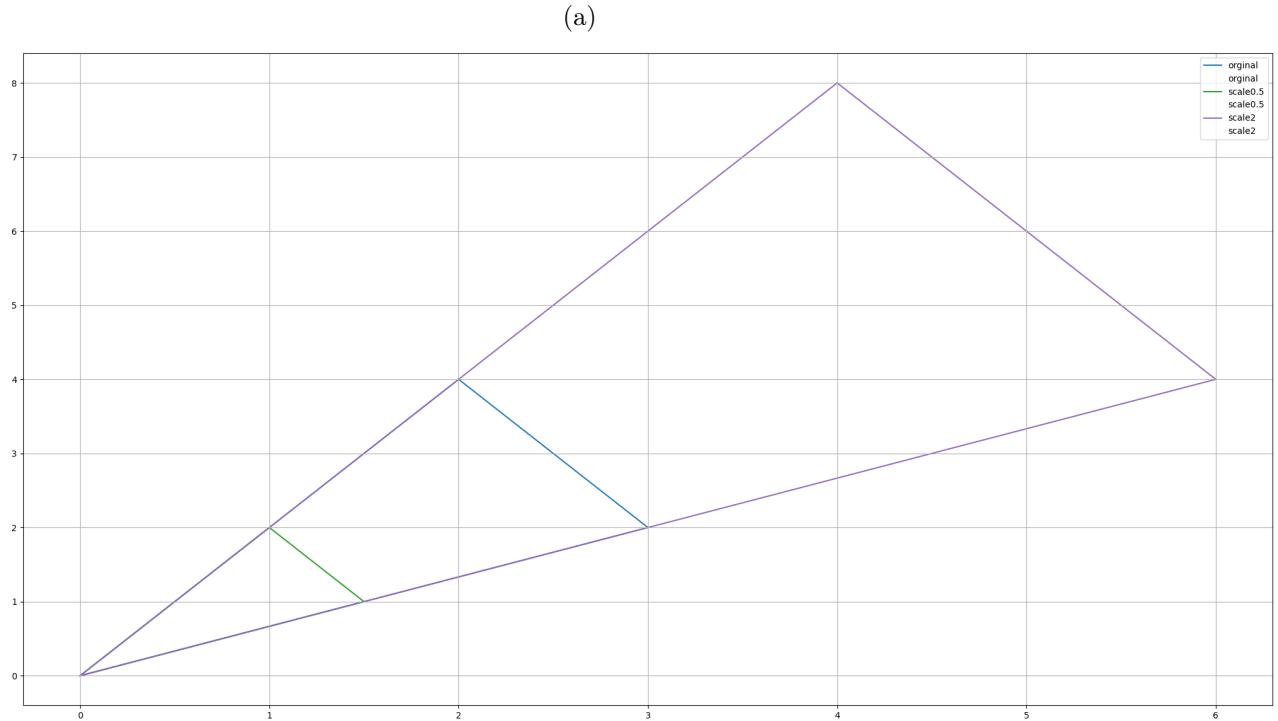


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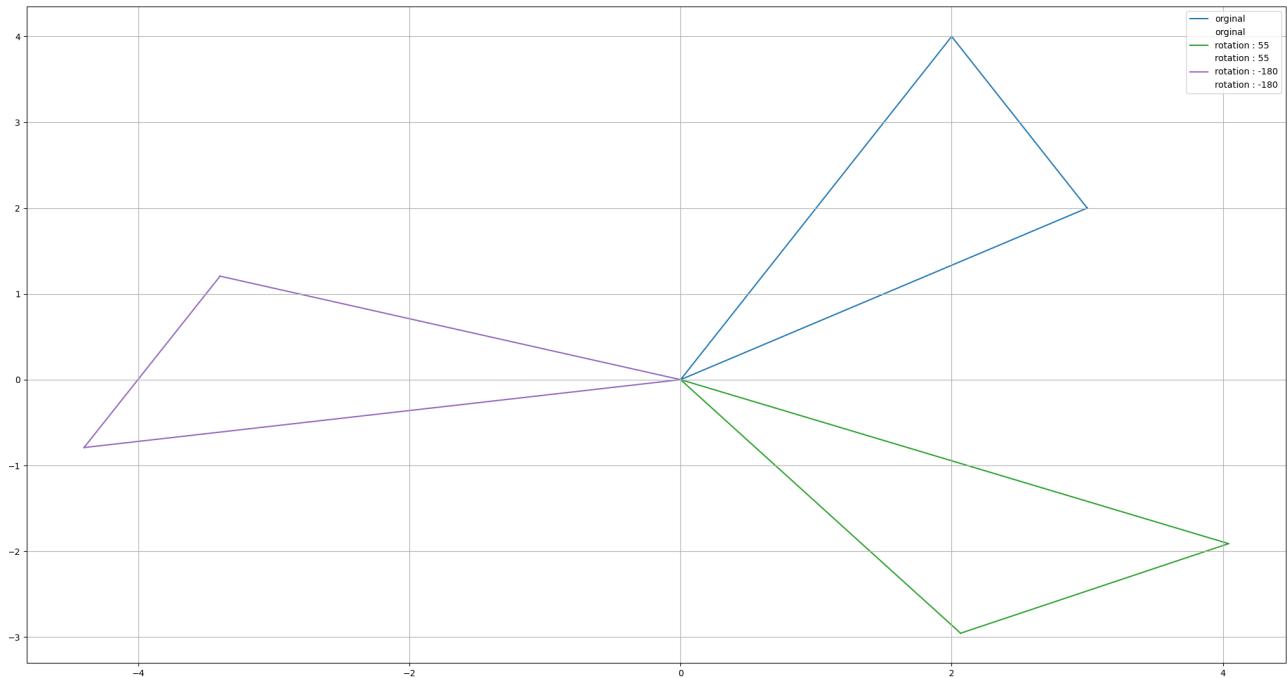
FACULTÉ DES SCIENCES

Département d'informatique

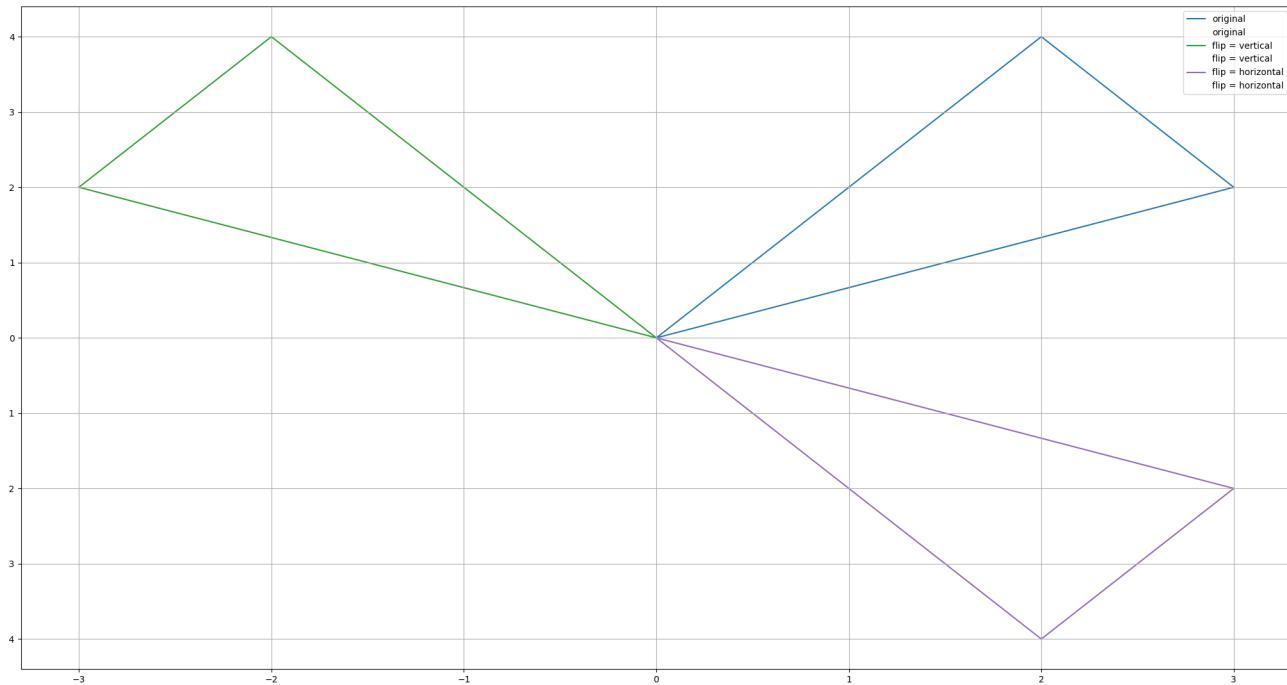
## Exercise 1



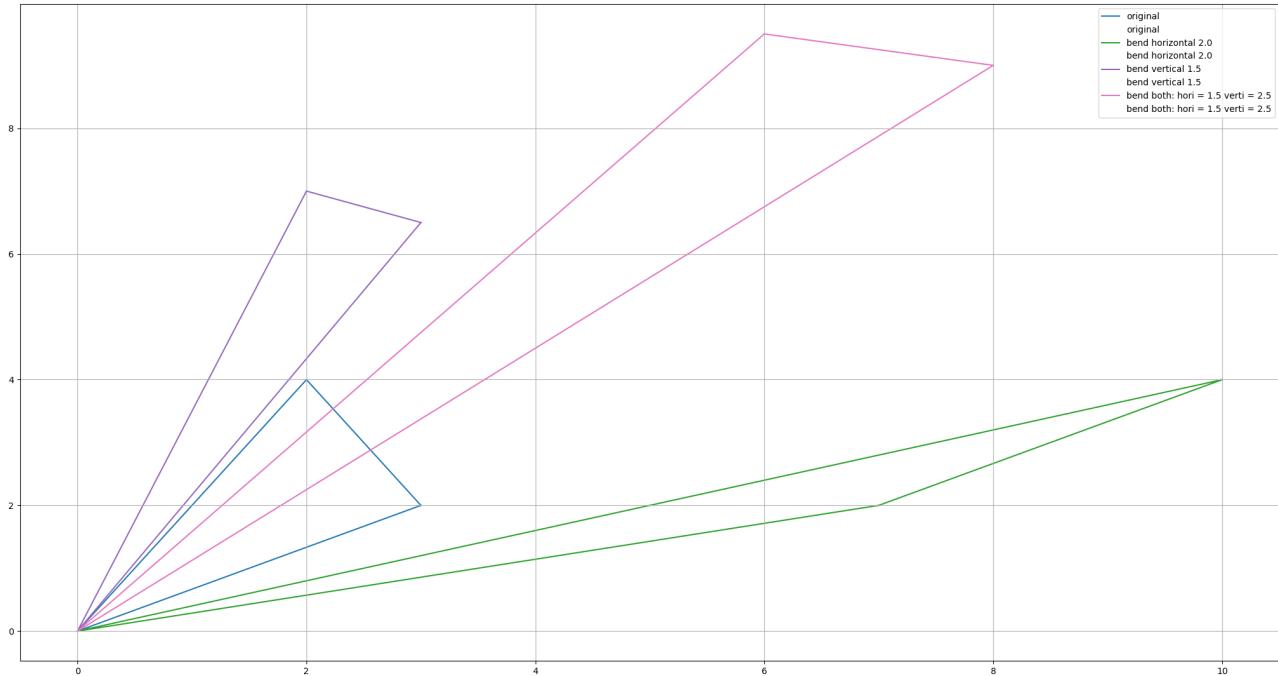
(c) I got the wrong results and I couldn't figure out the correct solution.



(d)

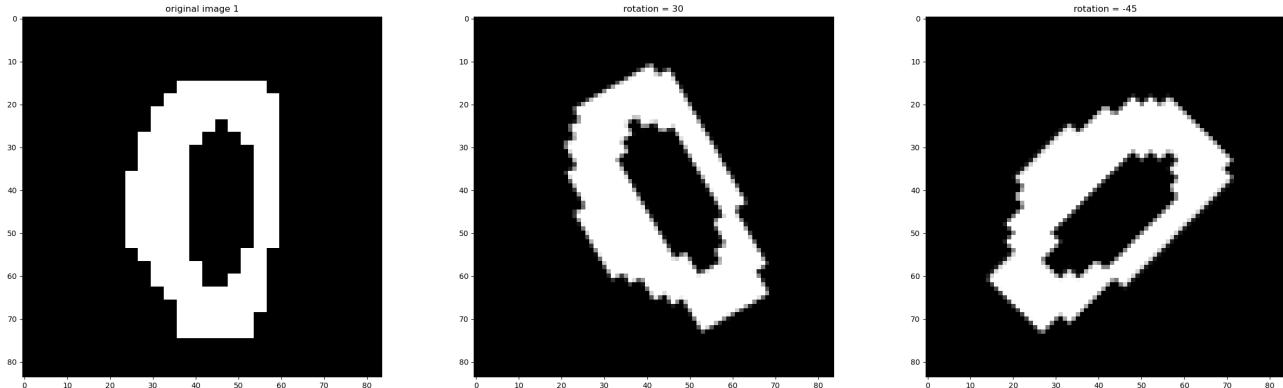


(e)



## Exercise 2

- (a) The rotated image lost quality, as we can clearly see some blurred pixels, image size is the same, and the corners seem unchanged, this is due to the fact that the lost pixels were black. The interpolation is not linear since the blurred pixels indicate some kind of averaging that would make the transition seamlessly, due to the image size, we clearly see these pixels.

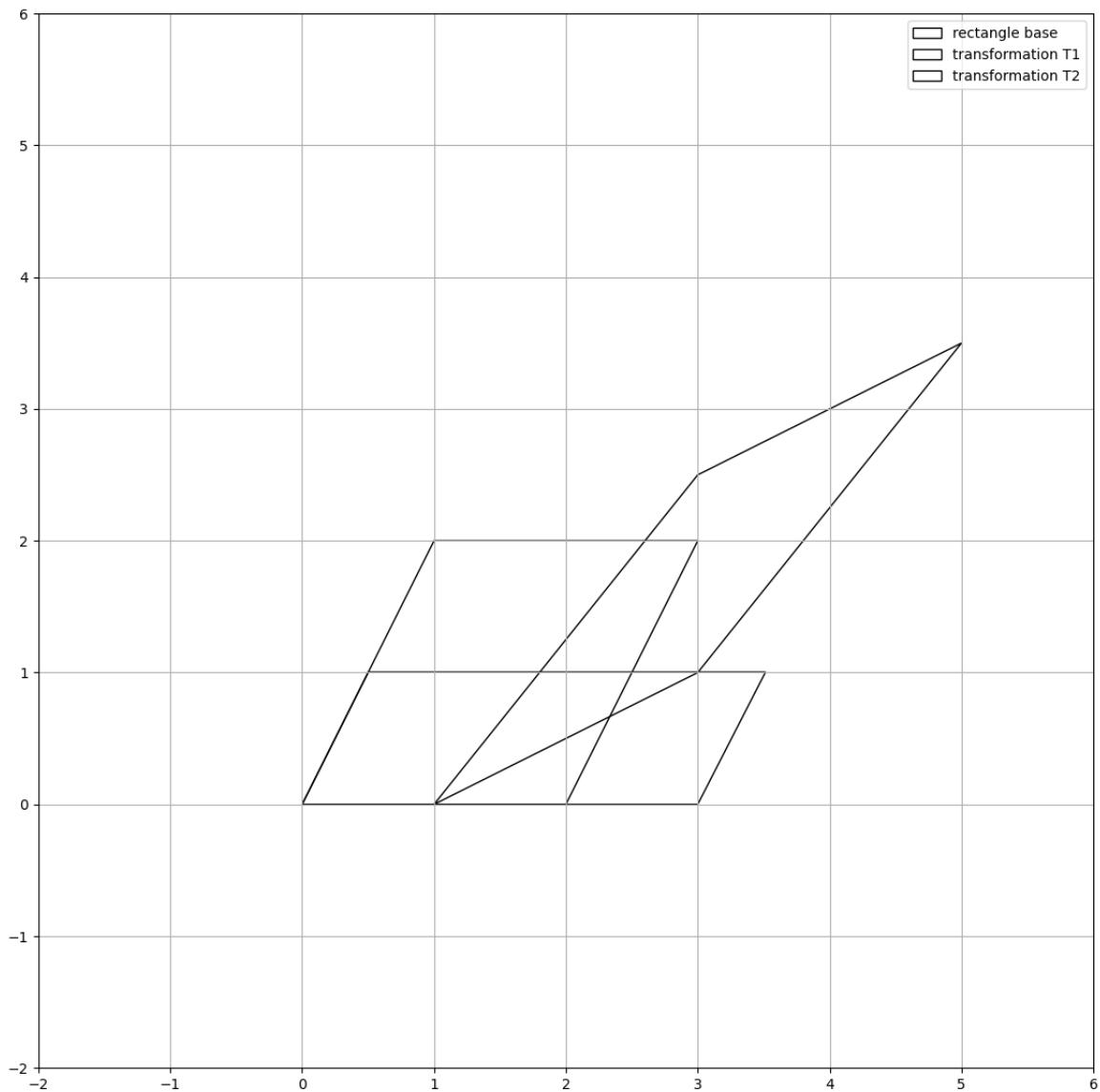


- (b) In this exercise we see the masked border problem, we lost the corners of the image, the image quality is however very good, we dont see the blurred pixels like in the (a) exercise.



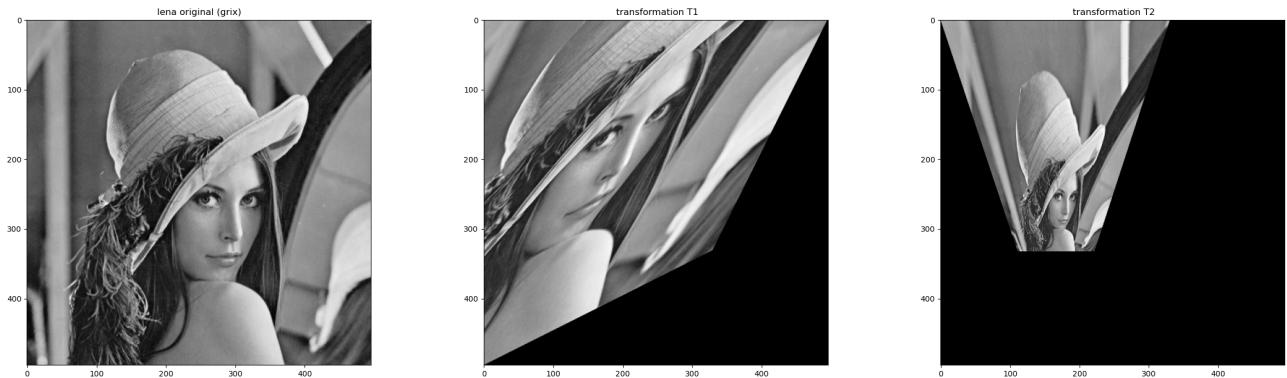
## Exercise 3

- (a) I'm not sure about the correctness of my results

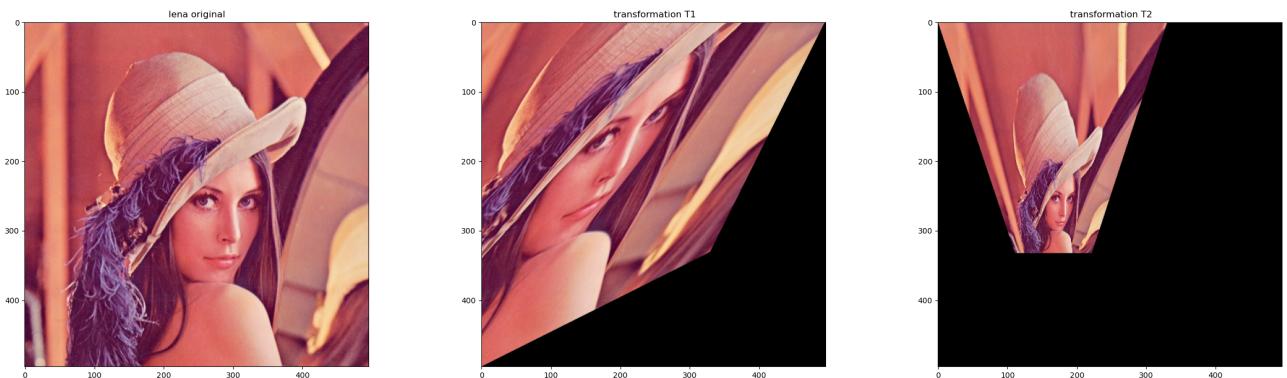


## Exercise 4

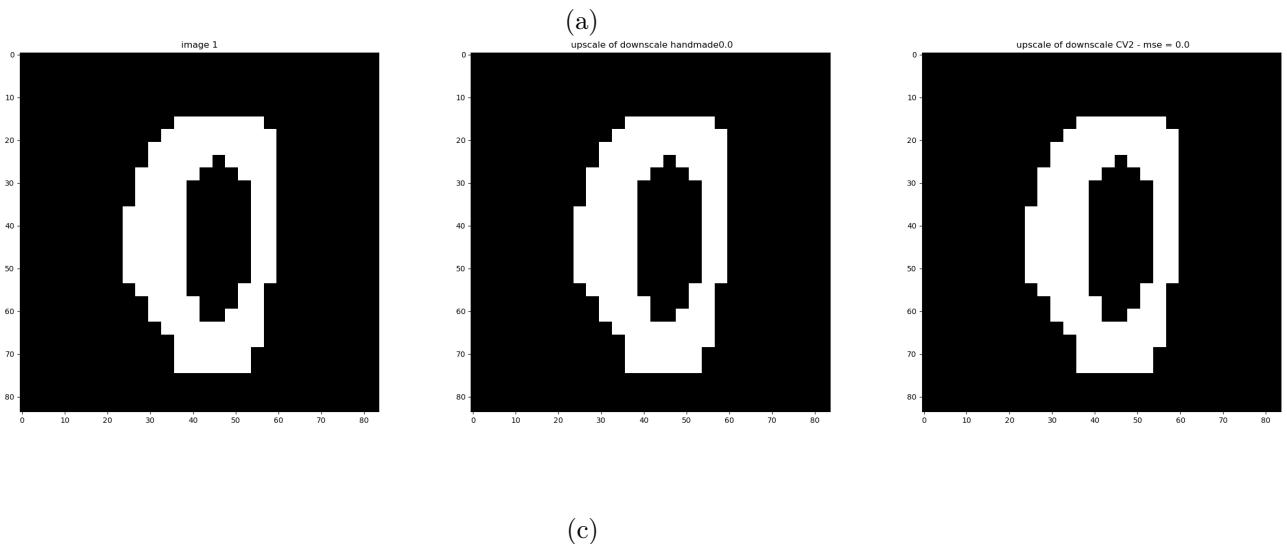
- (a) We can see that the transformed images still hold the general information, and since it has less pixels it's definitely smaller, we still clearly see lena, but if we would try to re transform the image back to it's original size we would have a quality loss.



- (b) Same can be said for the color image.



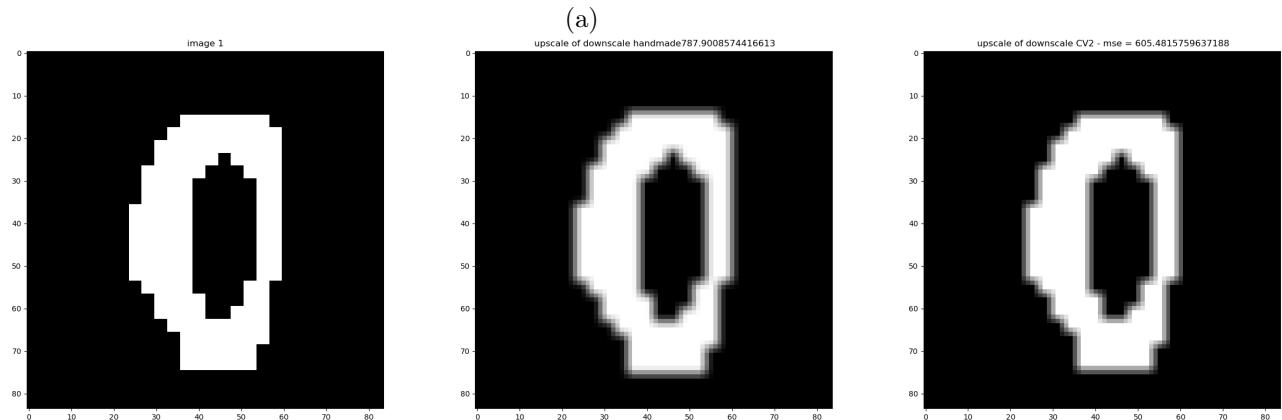
## Exercise 5





- (answer) We have an mse of 0 for the first image, which makes us think it is the perfect compression algorithm, but when we see lena we see that it's not so clear, the mse = 0 is due to the image. This large difference between the mse is normal, as image 1 was downscale-able by 3, and lena wasn't, so image information was lost, as expected.

## Exercise 6





- (c) Here we have different results for both images, worse mse for image 1, and better for lena, which is normal, in this technique, we average pixels as we do the operations, making a gradient-ish effect, which is perfect for lena, but not as good for image 1. This comes to show that both the basic and the complex techniques have advantages depending on the input.