Computer Vision HW#5

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**Task Description**

Implement binary morphological dilation, erosion, opening, and closing on a grayscale image. For the first four tasks, use the octagonal 3-5-5-5-3 kernel with intensity value = 0.

**Language & Tool**

* Python + Numpy
* OpenCV (for reading and writing image only)

**Work Flow & Results**

We first read in lena.bmp using function cv2.imread() and store the pixel values in a 2D array `img`. Unlike binary morphology, we perform dilation, erosion, closing, and opening on img directly. The following is the original image:



lena.bmp

The implementation is similar with the binary case, but now the grayscale value is set to be the maxima and minima for dilation and erosion, respectively. Once the two APIs are available, closing and opening should be easy: for closing, just simply call erosion(dilation(img, octagon), octagon); and dilation(erosion(img, octagon), octagon) for opening. The four output images are as follows:

 

lena.gray.dil.bmp lena.gray.ero.bmp

 

lena.gray.close.bmp lena.gray.open.bmp

To reproduce the result, execute the following command:

>> python ./main.py