Homework 5

For part (a) to (d) the mask is the octogonal 3-5-5-5-3 kernel.

(a)

The function `dilation(img, mask)` takes 2 arguments. The first argument is a gray scale image. The second argument is an n by 2 array indicating the mask used, and each element is a coordinate from the origin of the mask.

To do gray scale dilation on the image, for each pixel (r, c), for each (z, t) in the mask, new_img(r, c) = max(img(r - z, c – t)), (r - z, c – t) is inside the boundary of the image..

(b)

The function `erosion(img, mask)` takes same kinds of arguments as `dilation(img, mask)`.

To do gray scale erosion on the image, for each pixel (r, c), , for each (z, t) in the mask, if there is a (r + z, c + t) not in the image, new_img(r, c) = 0, otherwise, new_img(r, c) = min(img(r + z, c + t)).

(c)

Opening is done by calling `dilation(img, mask)` with the eroded image of part (b).

(d)

Closing is done by calling `erosion(img, mask)` with the dilated image of part (a).