MSCSIT

Exercise 4.

**Thresholding**

1. Consider the following 8 by 8 image:



Threshold it at

(a) level 100

(b) level 150

. What happens to the results of thresholding as the threshold level is increased?

1. Superimpose the image **text.tif** onto the image **cameraman.tif**. You can do this with:

**>> t=imread('text.tif');}**

**>> c=imread('cameraman.tif');}**

**>> m=uint8(double(c)+255\*double(t));}**

Can you threshold this new image m to isolate the text?

1. Create a function that does a contrast stretching transformation for different values of **m** and **E**.

Apply it to **spectrum.tif**. Also try a logarithmic transformation. Hint:

**g = c\*log(1+double(f))**

**g = 1./(1+(m./(double(f) + eps)).^E)**

1. Try the following commands (negative image)

**>> f = imread('chest-xray.tif');**

**>> imshow(f)**

**>> g1 = imadjust(f);**

**>> imshow(g1)**

**>> g2 = imadjust(f, [0 1], [1 0]);**

1. **>> figure,imshow(g2)**

How does changing the value of gamma affect the image? What types of images are different

values of gamma good for?

5. A large variety of image processing tasks can be accomplished by a technique called spatial

filtering. Spatial filtering involves a mask, consists of an array of values (*a-i*) and has a center

(gray). and translated across all possible pixel positions on the image. A new (filtered) image is produced by replacing the intensity value at the center by a linear combination of the intensity values of the center pixel and all neighboring pixels covered by the mask.



1. Try adding different types of noise to **ckt-board-orig.tif**. Look in the help for the

different options in **imnoise**. Then choose the appropriate filter to remove the noise.

1. Repeat for **pollen.tif**.
2. Capture your own image and repeat the task as in 1.