**CS 615**

**Digital Image Processing**

**Assignment #1**

**Part A**

The gray-level histogram is a graph of the frequency of occurrence of each gray level in an image I. Choose one gray-level image I. Write an M-file to display the histogram of I. Moreover, find its average optical density (AOD).

**Part B**

Obtain the image Mammogram. This image has 256×256 pixels. Each pixel has 8 bits.

1) Write a program to convert this gray scale image into a binary image by simple thresholding.

In the thresholded image, use a value of 255 for logical one and a value of 0 for logical zero. There are two main regions in the input image: the imaged tissue and the dark background region on the left side of the image. Select a threshold value so that the binary image output by your program is equal to logical one over the background region and logical zero over the tissue. Call this output image result1.

2) Write a program to implement the Approximate Contour Image Generation algorithm discussed in class. This program should input a binary image like result1 and output a binary contour image. Run the program on the image result1 produced above. Call the output image from this program result2. Display the original image, result1, and result2.

**Part C**

Obtain the image "spot.jpg". This is a 256 × 256 gray scale image with 8-bit pixels. Plot a histogram for the image. Write a program to perform a full-scale contrast stretch on the image. Display the enhanced image and plot its histogram.