BME 7112 PROCESSING OF MEDICAL IMAGES SPRING 2019

Homework Project # 5 (10 points) **Due Date: 02/28/19**

In this project, you will explore the use of display techniques for image enhancement. The test image file, "**BME7112_Data_File_5.tif"** is available on Pilot.

You are to write, in MATLAB, your own routines to perform the following tasks:

Part I

1. Change the display levels using linear (5A), logarithmic (5B), exponential (5C) and broken linear (5D) transfer curves. For all four cases, allow interactive software input of the relevant curve parameters. Your broken linear transfer curve is to have two breakpoints. Do not change the values of the image matrix; perform all display adjustments through look-up tables.

Part II

2. Transform the image with histogram equalization. Use two methods: overall (global) equalization (5E) and local equalization (5F). You must write your own histogram equalization routine for global processing. You may use MATLAB's built-in *histeq* or *adapthisteq* functions for local equalization, but be sure to determine optimal region sizes to achieve good results while avoiding visible transitions (i.e., "blocking"). You must also understand exactly how the pixel updating occurs.

3. Use another method of image equalization (your choice) that allows visibility of details in the bright and dark regions simultaneously (5G).

Submit your final images for all parts (5A-5G).

Submit your MATLAB code (one or several programs) and a report that explains your implementation approach; include resultant images and code sections in your report as needed to illustrate your approach and findings. Be sure to include all files needed for your code to execute, and please do not rename the input image.

Use these filenames:

Part I:	Code:	"BME7112_HW5_1_YLN_yourFilename.m" Indicate A/B/C/D in filename if separate .m files
	Images	"BME7112_HW5_YLN_5X.tif" X = A/B/C/D
Part II:	Code:	"BME7112_HW5_2_YLN_yourFilename.m" Indicate E/F/G in filename if separate .m files
	Images	"BME7112_HW5_YLN_5X.tif" X = E/F/G
Combined Report:		"BME7112_HW5_YLN.docx" (or .pdf)