Lab Exercises: LAB 5
(Histogram & Histogram Equalisation)

General guidance:

1. Download the template code to make menus and demonstrate how to read, write and manipulate images.
2. All the images you use can be downloaded from the course website: http://www.eecs.qmul.ac.uk/~phao/IP/Images/
3. For RAW images, the files have no head data, just the image data as matrices stored. For our RAW images, we do not provide the colour components, and all the data are gray-scale values, a one-byte unsigned integer per pixel, value from 0 to 255.
4. The size of image Cameraman is of 128x128. Other images are of 512x512.

Exercise 1.

Finding Histogram

To find the histogram of an image by counting the numbers of the pixel values in the image.

Exercise 2.

Histogram Normalisation

To normalise a histogram by dividing by the number of the counted pixels.

Exercise 3.

Histogram Equalisation

To equalise a histogram of an image and to find the transform (corresponding gray levels for mapping) for histogram equalisation and then apply the transform to the image.

Exercise 4 (for MSc students).

Histogram Displaying

To make a histogram into an image and display the image in a window. The image can be sized to 256-by-256.

Questions: What happens if we apply histogram equalisation twice to the same image? Are the transforms the same if we apply histogram equalisation to different regions of interest (ROI) in an image?