Lab Exercises: LAB 1
(Image I/O & display)

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 QMplus module page or from the 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.
5. If your compiler does not provide the functions for reading all the formats, you just need implement for read/write images of one format.

Exercise 1.

Complete the GUI for image processing exercises

Download the template code (Demo.java) and get familiar with the code and prepare the GUI for the following lab exercises in future. The GUI should include a menu system and "undo" function. The functions you will implement for the following exercises in future should be found to execute as new entries in the menu system. "undo" should be an item in the menu and can be for just one operation back. You can use a buffer or a stack to back up the image of the previous step for your "undo" function.

Exercise 2.

Read and display multiple images

Learn and implement reading and displaying multiple images based on the template code. This will be used in future for displaying the original images and the processed images for side-by-side comparison. Display multiple images is for at least 2 images displayed side-by-side in one window or in two windows.

Exercise 3.

Image I/O: Reading an image from an image file of different formats, including RAW (To read RAW format has been cancelled. You will have 5 extra marks if you have done it.)

To read an image file into a matrix and display the image, given the image size if it is a RAW format. The image format can be any one that you can process easily, but the gray levels of the images should be from 0 to 255 (8 bits). The image file names should be chosen from a dialog box or a standard menu, but cannot be hard coded.

Questions: Can we try to guess the dimensions of a RAW image if only the size of the image data is given? How?