Lab Exercises: LAB 4
(Point Processing and Bit Plane Slicing)

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.
Negative Linear Transform
To apply negative linear function $s = L-1-r$ to images. (This has been give as an example in the template code.)

Exercise 2.
Logarithmic Function
To apply logarithmic function $s = c \log(1+r)$ to images.

Exercise 3.
Power-Law
To apply power law $s = c\ r^p$ to images with different powers from 0.01 to 25.

Exercise 4.
Random Look-up Table
To make a lookup table with random numbers and take it as a point processing function and apply for image processing.

Exercise 5.
bit-plane slicing
Choose a bit (0-7) and display the bit plane of an image as a binary image.

Questions: What we need do if c is 1 in the logarithmic function and power law? For c=1, what power makes power law similar to logarithm function for image processing? How can we find *c* automatically if we wish to map 0 to 0 and 255 to 255 after transform?