# Programming Assignment 2

1. For the attached image 'spine.tiff', enhance it using

   (a) The log transformation and (b) A power-law transformation

   In (a) the only free parameter is c, but in (b) there are two parameters, c and r for which values have to be selected. By experimentation, obtain the best visual enhancement possible with the methods in (a) and (b). Once (according to your judgment) you have the best visual result for each transformation, explain the reasons for the major differences between them.

2. Write a function, generateHistogram, which generates the histogram of an image. The function should take an image data array (with pixel values in the range 0 – 255) as its only parameter and return an array containing the histogram of the image. The histogram can be displayed using the built in plotting function. Use this new function to generate and display histograms for the following images.
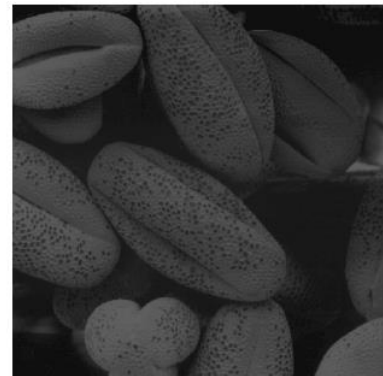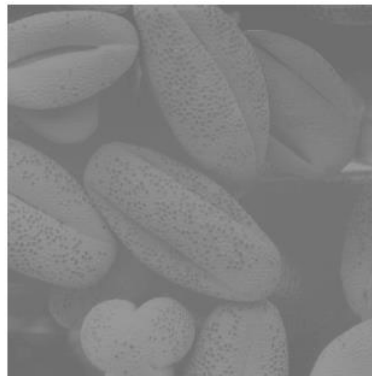
3. Implement a histogram equalization function. Use it to enhance the above images. Compare the output of your implementation with any built-in library function.

4. Using any programming language you feel comfortable with, load an image and then perform a simple spatial 3x3 average of image pixels. In other words, replace the value of every pixel by the average of the values in its 3x3 neighborhood. Be careful with pixels at the image boundaries. Repeat the process for a 10x10 neighbourhood and again for a 20x20 neighbourhood. Observe what happens to the image and give explanation for it. If you are using Matlab, investigate simple command lines to do this important operation.

5. Try to enhance the 'skeleton.jpg' image by performing sequence of operations as discussed in the textbook/class or any other alternative method.

6. Consider the figure below and the problem of matching a given image template (ex. Image with symbol 'T') to different regions/objects in a target image (the bigger image with many symbol). Based on the techniques studied till now, try implementing a method to locate the region in the target image which matches with the template image.

UTK T