Image Processing: Matlab Tutorial

This is an unassessed coursework to help you learn some key Matlab features that you will undoubtedly need at some point during this module. For those of you who have previous Matlab experience please feel free to skip the first few sections. This coursework should be worked on during the scheduled tutorial sessions where you can ask questions if you get stuck.

Task 1: Basic loading and displaying

- Download a color image, **load** the image and **display** it.
- Convert the image to **gray scale** and display it.
- Learn more about how Matlab stores the image data in memory, try accessing the **red**, **green** and **blue channels** separately displaying them as you go along.
- If you used the Matlab function to convert the image to grayscale, try writing your own method.

Some methods that might be useful are: imread, imwrite, imshow, rgb2gray
If you would like to find out what a function does simply type 'help imread' and this will give you a detailed description of the function and its parameters

Task 2: Learning to use Matlab help

- Research how you can select a polygon (hint: look at roipoly)
- Experiment with what you find and understand what information can be gained from this.

Task 3: More advanced basics

- Transpose the image i.e. flip the image across its diagonal
- Split the image into four equal parts and display these images.
- Optional: Use subplot to plot all four images in the same figure.

Task 4: Scaling and loops

- Use the Matlab function to scale the image
- Write your own Matlab function that would scale down an image using an average of four pixels.
- Similarly how can you double the size of an image? What sorts of artefacts are visible if you do so? Try and code this out to see for yourself.