

WAES 3106

(DEADLINE 14 March 2014 (Friday), 11.59pm)

Tutorial 1 (Homework)

- **Be sure to turn in:** A listing of your code and printouts of the original and modified images.
- Turn this assignment in **electronically** using Spectrum
- **Late policy:** 20% off from each extra late day.

1. Use Matlab for this problem. Obtain the images “lena.jpg” and “peppers.jpg” from the spectrum. Each image has 225 x 225 pixels and each pixel has 8 bits.

- a. Read and display the two images

(2 marks)

- b. Define a new 225 x 225 image A as follows: the left half of A , e.g. the first 122 columns, should be equal to the left hand of the Lena image. The right half of A , e.g. the 123th column through the 225th column, should be equal to the right half of the Peppers image.

(8 marks)

2. Use Matlab for this problem. Obtain the colour image “lena512colour.jpg” from the spectrum. It is the same image that you used above, except this time it is in colour (each pixel has 24 bits) and the size is 480 x 480 pixels. If you read the image into a Matlab array $A1$, then $A1(:, :, 1)$ is the **RED** band, $A1(:, :, 2)$ is the **GREEN** band and $A1(:, :, 3)$ is the **BLUE** band. In each band, each pixel has 8 bits.

- a. Use imread to read the image and then display it. Lets call this image $A1$.

(2 marks)

- b. Make a new colour image $A2$ by swapping the colour bands of $A1$ as follows. First, just set $A2 = A1$ to initialize the new image with the right size. Then make the **RED** band of $A2$ equal to the **BLUE** band of $A1$, make the **GREEN** band of $A2$ equal to the **RED** band of $A1$, and make the **BLUE** band of $A2$ equal to the **GREEN** band of $A1$. For example. To set the **RED** band of $A2$ equal to the **BLUE** band of $A1$, you can type $A2(:, :, 1) = A1(:, :, 3);$.

(6 marks)

- c. Display the new image and use imwrite to write it out to a JPEG file.

(2 marks)