**Problem Statement**:

The goal of this assignment is three-fold:

Enhance edges of the following image using:

a) Roberts cross operator (Please read Roberts cross operator from the book)

b) Sobel’s operator

c) Apply Laplacian operator in 3x3 window and show the results.

**Conclusion:**

Implementing the three methods, which are Robert’s, Sobel’s and Laplacian, all can generate images with edge detection, and after implementing the threshold value of 100, the edges of the image become like a “line drawing” and are able to define the edges very well. We are also able to find where the gradient values are high at a threshold value of 100. At lower threshold values the edges become spurious or noisy. If we compare the edges generated using Sobel’s method vs Robert’s cross method, we notice that with Sobel’s operator, generating edges tends to be slower than Robert’s cross operator. However, due to its larger convolution kernel, it can smooth the input image to a greater extent and thus making the operator less sensitive to noise. We also notice that the edges produced using Sobel’s method produces considerably higher output values for similar edges, compared to Robert Cross. If we compare Laplacian operator to Sobel’s method, we notice that the edges produced using Laplacian tend to be a lot less smooth. We also notice that with a threshold value of 100, the edges are a lot more noisy when compared with Sobel’s and Robert’s operator, thus making it difficult to define the edges and finding where the gradient values are high.