University of North Dakota
Department of Electrical Engineering

EE 456 Digital Image Processing

Homework #2

1. Write a MATLAB program that performs a 3x3 linear filtering operation on a given gray level image. Use linear filtering method discussed in the lecture. **Do NOT use any MATLAB built-in filtering commands.** Test your code with the following filter and "cameraman.tif" image. Submit the source code, input and filtered images.

Filter

0	1	0
1	-4	1
0	1	0

2. Use your filtering code implemented in Question 1 and perform a sharpening filtering on "lena_gray.jpg" image. Use sharpening filtering method discussed in the lecture. Give the results for two different high-boosting constant values. **Do NOT use any MATLAB built-in sharpening and filtering commands.** Submit the source code, input and filtered images.

3. Apply the following filters to images using MATLAB built-in filtering commands. You can use any MATLAB built-in command. Submit the source code, input and filtered images.
    a. 7x7 Average filter to "lena_gray.jpg" image
    b. 7x7 Gaussian filter to "lena_gray.jpg" image
    c. 5x5 Median filter to "noisy_img.png" image
    d. Any Sharpening filter to "lena_gray.jpg" image
    e. Sobel horizontal filter to "cameraman.tif" image
    f. Sobel vertical filter to "cameraman.tif" image

Notes:

1. Use subplot function to show your images and other plots, so that they look visually organized.
2. Submit your file as a single PDF file.