

Homework-9

Problem 1: Basic read and write images using Matlab

- a) Read and show the image lena.bmp (copy your code and the plot into your report).
- b) Convert the image into gray-scale using the Matlab's built-in function `rgb2gray`.
- c) Write your own function `my_rgb2gray` to convert a RGB image to grayscale and test it on the lena.bmp image (show the image after being converted). Given that, for each pixel we have

$$\text{gray scale intensity} = 30\% * R + 60\% * G + 10\% * B$$

- d) Save the above gray-scale image to a file named `lena_gray.jpg`.

Problem 2: Histogram equalization (enhance the contrast of an image)

- a) Read and show the image `lowcontrast.jpg`.
- b) Show the histogram of the image using the function `imhist`.
- c) Using the function `histeq` to enhance contrast using histogram equalization, show the histogram and the image after enhancing.

Problem 3: Salt and pepper noise, median filter

- a) Add salt-and-pepper noise to the lena's gray-scale image using the function `imnoise`. Assume that the noise density is 0.05 (read the function's documentation for more information). Show the noisy image.
- b) Filter the noise using the function `medfilt2` with the 3x3 window, show the filtered image.
- c) Filter the noise with the 5x5 window and show the filtered image; compare the filtered image to that of 3b). What happen when we increase the window size in the median filter?