

## FL #2

1. Design a function to generate the binary image.

Input : image, threshold

Output : binary image

2. Design a function to find the histogram for given input gray image.

Input : image, number of bins (N)

Output : histogram (Nx1 vector)

3. (Option) Design the Otsu algorithm.

Input : image

Output : binary image

4. Design a function to compute MSE and PSNR.

Input : image1, image2

Output : MSE, PSNR

$$MSE = \frac{1}{m n} \sum_{i=0}^{m-1} \sum_{j=0}^{n-1} [I(i, j) - K(i, j)]^2$$

The PSNR is defined as:

$$\begin{aligned} PSNR &= 10 \cdot \log_{10} \left( \frac{MAX_I^2}{MSE} \right) \\ &= 20 \cdot \log_{10} \left( \frac{MAX_I}{\sqrt{MSE}} \right) \end{aligned}$$

5. Generate  $M \times N$  random noisy image.

Input :  $M, N$ , type\_of\_noise = uniform or Gaussian

Output :  $M \times N$  noise

6. Compute MSE and PSNR for noisy image.