IDC 410 : Machine Learning
Assignment 1

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1. Take an image of something you like and convert it to **greyscale**.

   - Extract the **intensity array** of the image.
   - Plot the **histogram** of the intensity values.

   This **histogram** will show how the different intensity levels are distributed in the image. Additionally, verify that the sum of all histogram frequencies equals the total number of pixels in the image, just for fun!

2. Take a image, we can represent it as a $n_{pixel} \times n_{pixel}$ matrix as follows, with each value representating intensity of the pixel.

$$A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n_{\text{pixel}}} \\ a_{21} & a_{22} & \cdots & a_{2n_{\text{pixel}}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n_{\text{pixel}}1} & a_{n_{\text{pixel}}2} & \cdots & a_{n_{\text{pixel}}n_{\text{pixel}}} \end{bmatrix}$$

   Now setect a region($n \times n$) matrix and then modify it, like change its intensity, color, and see how it looks now. This will help to understand the Intensity array and also manuplate it?

3. Explore the possible way to relate optical image and physical parameters of objects in image.

4. Propose the method to get focal length of mobile camera.