1. Instructions
   - Implement the following problems in Python or MATLAB.
   - Do not copy code from any source.
   - Submit the Assignment in the Google Classroom within the deadline and also write down the conclusion.
   - The assignments will be evaluated during lab hours.

Fig 1

Task 1: Load and Display Image

Write a Python script that loads a color image from a file, displays it in original image , gray scale image and binary image, and saves the displayed image as a new file. Use the OpenCV library for image processing.

Task 2: Visualize R, G, B Channels

Separate the loaded color image into its Red, Green, and Blue channels. Visualize each channel separately and discuss the differences observed in each channel.

Task 3: Enhance Contrast

Apply contrast enhancement to the grayscale image using histogram equalization. Display the original grayscale image and the enhanced grayscale image.

Task 4: Enhance Contrast with different methods

Histogram Equalization, CLAHE(Contrast Limited Adaptive Histogram Equalization), and Gamma Correction.

Task 5: Color Complement

Implement a function to obtain the color complement of the original color image. Display the original and the color complement images side by side.

Task 6: Hue, Saturation, Intensity (HSI)

Convert the original color image to the HSI color space. Visualize and discuss the changes in the Hue, Saturation, and Intensity components.

Task 7: Chromaticity Diagram

Create a chromaticity diagram by plotting the normalized R, G, and B values for each pixel in the color image. Discuss the distribution of colors on the diagram.

Task 8: Color Slicing

Implement a color slicing operation that highlights a specific color (Ex. Yellow color, RED color) range in the image. Choose a color range and display the original image alongside the result of color slicing.

Task 9: Pseudo-Coloring

Apply a pseudo-coloring technique to the grayscale image. Discuss the choice of color map and the impact on the visual perception of the image. color_maps = ['viridis', 'plasma', 'inferno', 'magma', 'cividis', 'cool', 'spring', 'summer', 'autumn', 'winter']

Task 10: Intensity Scaling

Perform intensity scaling on the original grayscale image to adjust the brightness and contrast. Display the original and scaled images for comparison.