Assignment 1

1. All codes must be done using Python.

2. Additional Packages are allowed only where it is mentioned.

3. A report on the algorithm used and your observations should be submitted for each of the parts.

4. Submit your codes (part 1 and part 2 as separate .py files), reports and the generated output images in a zipped folder.

Part 1: Contrast Enhancement [5+15+15+5+10]

1. Read image contrast.jpg. **(use package)**

2. Convert the image to HSV.

3. Apply contrast enhancement in a way that only the achromatic part changes and the colour vector is preserved.

4. Save the enhanced image. **(use package)**

5. Write a report explaining your algorithm and your observation of the output.

Part 2: Saturation-Desaturation [5+15+20+10]

1. Read image flower.jpg. **(use package)**

2. Implement saturation and desaturation operations on colour image (“flower.jpg”). Assume any plausible coordinates of vertices of the gamut triangle in the CIE chromaticity chart. Save the following output images:

    a. Maximally saturated image, Desaturated image and Saturated-desaturated image.

    b. Plots of chromaticity points of each cases including the original image. Use the attached ciexyz31_1.csv, which provides colour matching functions in XYZ space for every monochromatic colour. Every row contains the information as follows: Wavelength (in nm), X, Y, and Z.

3. Write a report explaining your algorithm and your observation of the output.