Name : Vedasri Nakka

GitHub link: <https://github.com/VedasriNakka/Image-Processsing-Assignment/tree/main/Assignment%203>

Description:

**Rgb\_to\_hsl conversion**: loop over all rows and colums of the pixels of the image. Then devided the *R*,*G*,*B* values by 255 to change the range from 0 - 255 to 0 -1. Caluculated Cmax, Cmin and delta = Cmax – Cmin. Calculated Luminance(l) by (Cmax + Cmin)/2, Saturation(s) by delta / (1 - abs(2 \* l - 1)), if delta is 0 the S is 0. And Hue if delta == 0:h = 0, elif cmax == r: h = 60 \* (((g - b) / delta) % 6), elif cmax == g: h = 60 \* (((b - r) / delta) + 2), else: h = 60 \* (((r - g) / delta) + 4)

**Hsl\_to\_rgb conversion:** Calculated c,x,m c = (1 - abs(2 \* l - 1)) \* s / 100, x = c \* (1 - abs((h / 60) % 2 - 1)), m = l - c / 2 then R’, G’, M’ with the conditions. Finally, calculated rgb. r, g, b = (R’ + m) \* 255, (G’ + m) \* 255, (B’ + m) \* 255

**histogram\_equalization Function:** I calculated the image's histogram, then creatd a cumulative distribution function (CDF) from the histogram. The CDF is normalized to the range [0, 255], This process involves spreading out the different shades in the image more evenly, which makes the image look better by enhancing contrast and improving the clarity and details.

**Visually compare the result of the two images after equalizing the histograms (RGB and HSL). What can you observe?**

The equalization in RGB space results in more vivid and contrast-enhanced colors, and color shifts.

The equalization in HSL space mainly affects the brightness and contrast while preserving the hue (color) and saturation (intensity), resulting in a more natural color appearance. But After converting the result of HSL to RGB we can observe high contrast then original and less saturation