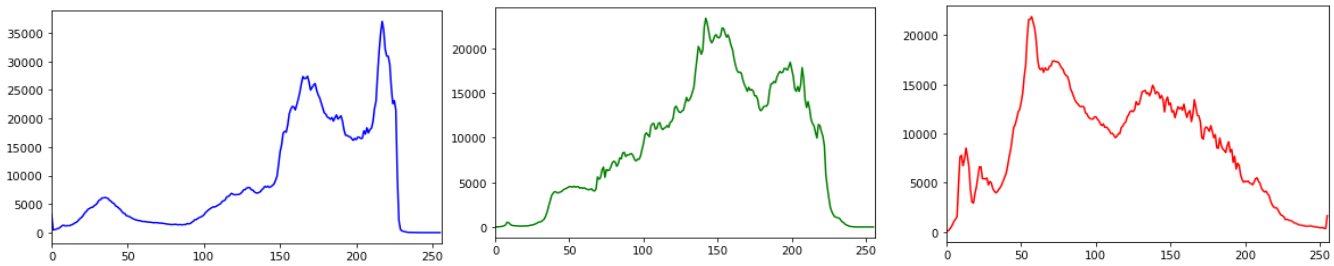
SIT789

Assignment 1.3: Image histograms

A1:

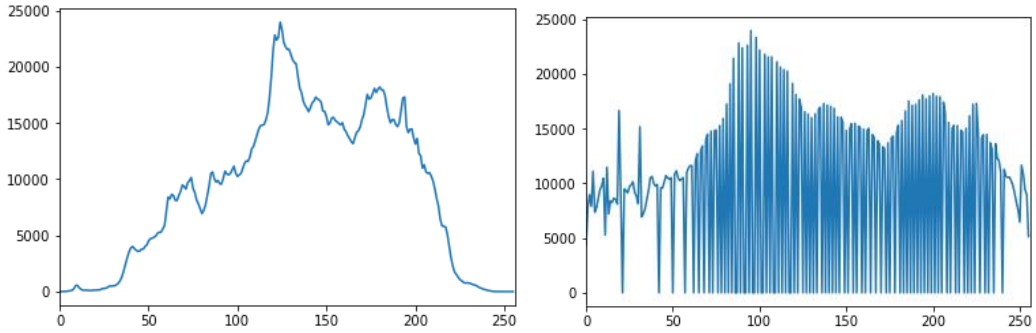
a: Histograms for the blue, green and red channel of img1.jpg from Task 1



(a) *(b)* *(c)*

Fig 1: a) Histogram for Blue channel, b) Histogram for Green Channel, c) Histogram for Red channel

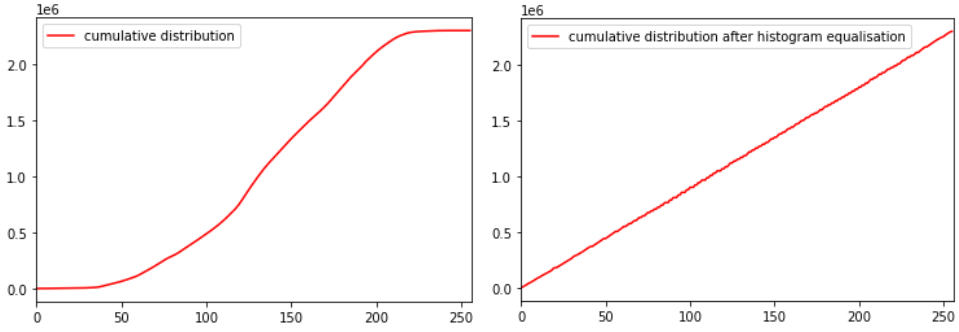
b: Intensity histograms of img_gray and img_eq from Task 2



(a) *(b)*

Fig 2: (a) Intensity Histogram for grayscale image, (b) intensity histogram for equalised image

c. Cumulative distributions of intensity of img_gray and img_equ from Task 2.



(a) *(b)*

Fig 3: (a) Cumulative distribution of img_gray, (b) cumulative distribution of img_equ

A2:

(a) (b)

Fig 4: (a) Grayscale image, (b) equalised grayscale image

A3:

The distance values using χ2 distance:

- Img1 – img2: 1567300 (with normalised hist: 0.68)
- Img1 – img3: 1434813 (with normalised hist: 0. 62)
- Img2 – img3: 837586 (with normalised hist: 0. 36)

This shows that using χ2 distance **Img2 – Img3** pair is most similar, as it has least distance (0.36).

Note: The normalised hist values denote* when *χ2 distance is calculated using normalised histogram.

The KL Divergence values:

- Img1 – img2: 1.73
- Img1 – img3: 1.66
- Img2 – img3: 1.91

This shows that using KL Divergence, **img1 – img3 pair** is most similar as it has least distance (1.66).

Note: Here, KL Divergence is calculated as KL(h1,h2) + KL(h2,h1) for h1 and h2. The workings are shown in the code.