Histogram-of-an-images

Aim

To obtain a histogram for finding the frequency of pixels in an Image with pixel values ranging from 0 to 255. Also write the code using OpenCV to perform histogram equalization.

Software Required:

Anaconda - Python 3.7

Algorithm:

Step1:

Read the gray and color image using imread()

Step2:

Print the image using imshow().

Step3:

Use calcHist() function to mark the image in graph frequency for gray and color image.

step4:

Use calcHist() function to mark the image in graph frequency for gray and color image.

Step5:

The Histogram of gray scale image and color image is shown.

Program:

```
# Developed By: Cynthia Mehul J
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import matplotlib.pyplot as plt
import cv2

grayscale_image = cv2.imread("snoopy.jpg", cv2.IMREAD_GRAYSCALE)
color_img = cv2.imread("snoopy.jpg")

gray_hist = cv2.calcHist([grayscale_image], [0], None, [256], [0, 256])
hist_b = cv2.calcHist([color_img], [0], None, [256], [0, 256])
hist_g = cv2.calcHist([color_img], [1], None, [256], [0, 256])
hist_r = cv2.calcHist([color_img], [2], None, [256], [0, 256])

plt.figure(figsize=(12, 5))

plt.subplot(1, 2, 1)
plt.imshow(grayscale_image, cmap='gray')
plt.title('Grayscale Image')
plt.axis('off')

plt.subplot(1, 2, 2)
plt.imshow(cv2.cvtColor(colourscale_image, cv2.COLOR_BGR2RGB))
plt.title('Color Image')
plt.axis('off')

plt.show()

plt.figure(figsize=(12, 5))

plt.subplot(1, 2, 1)
```
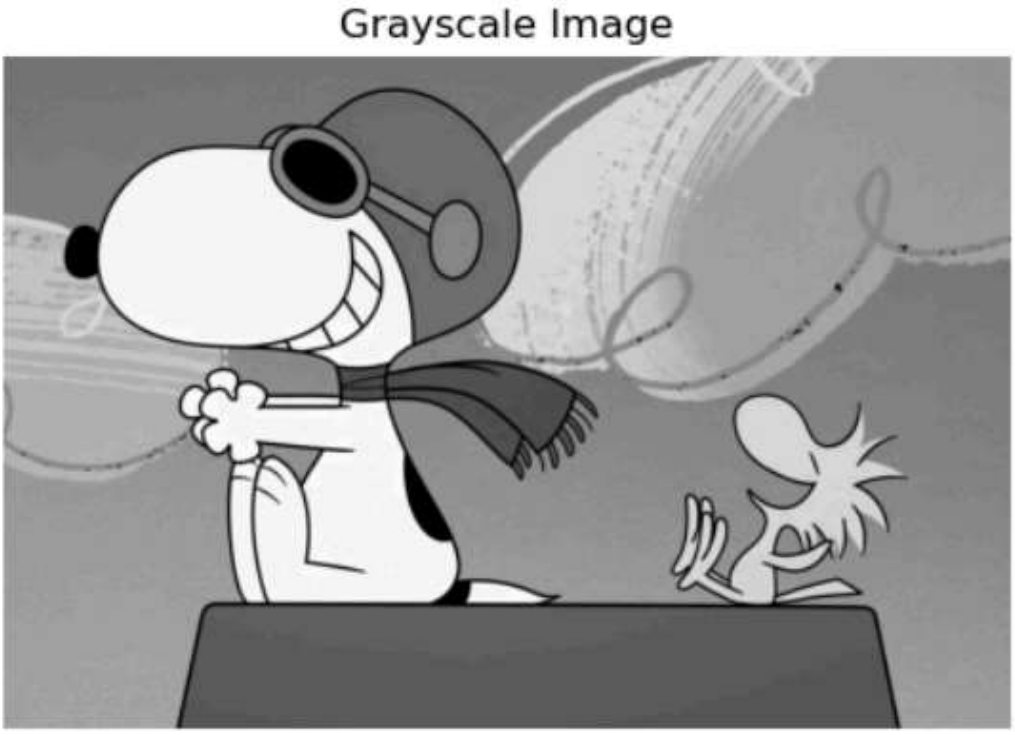
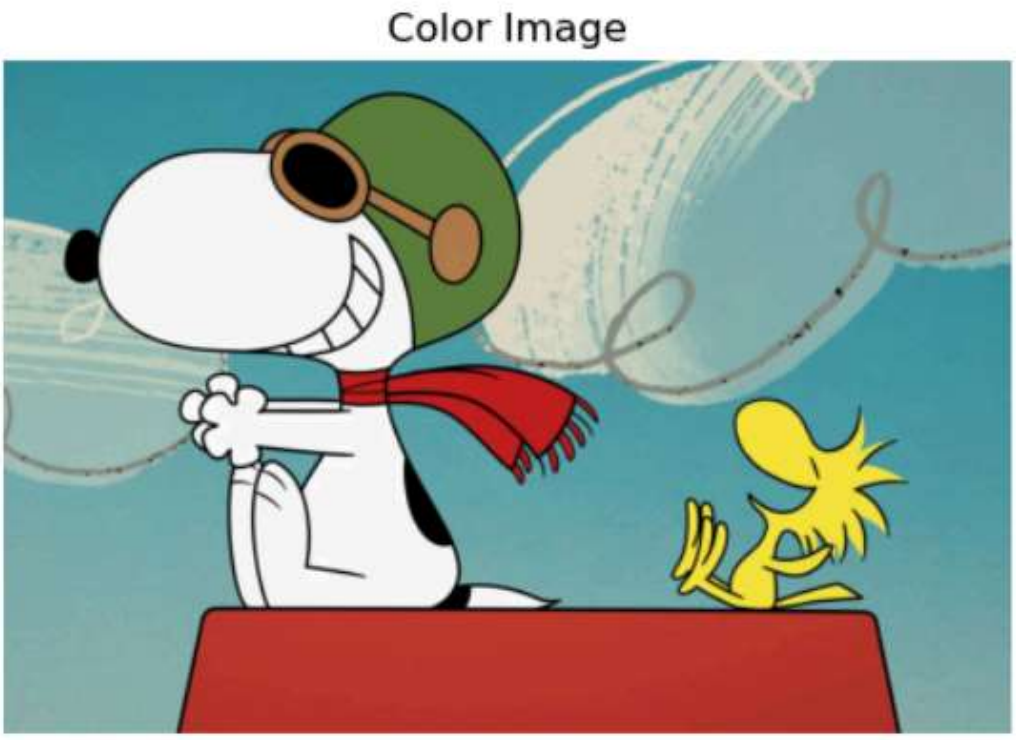

```
plt.plot(gray_hist, color='black')
plt.title("Grayscale Image Histogram (Normalized)")
plt.xlabel("Pixel Intensity")
plt.ylabel("Normalized Pixel Count")

plt.subplot(1, 2, 2)
plt.plot(hist_r, color='red')
plt.plot(hist_b, color='blue')
plt.plot(hist_g, color='green')
plt.title("Color Image Histogram (Normalized)")
plt.xlabel("Pixel Intensity")
plt.ylabel("Normalized Pixel Count")

plt.show()

equalized_grey_img = cv2.equalizeHist(grayscale_image)
plt.title("Equalized Hist of Gray Image")
plt.hist(equalized_grey_img.ravel(),bins=256,color='black',alpha=0.6)
plt.show()
```

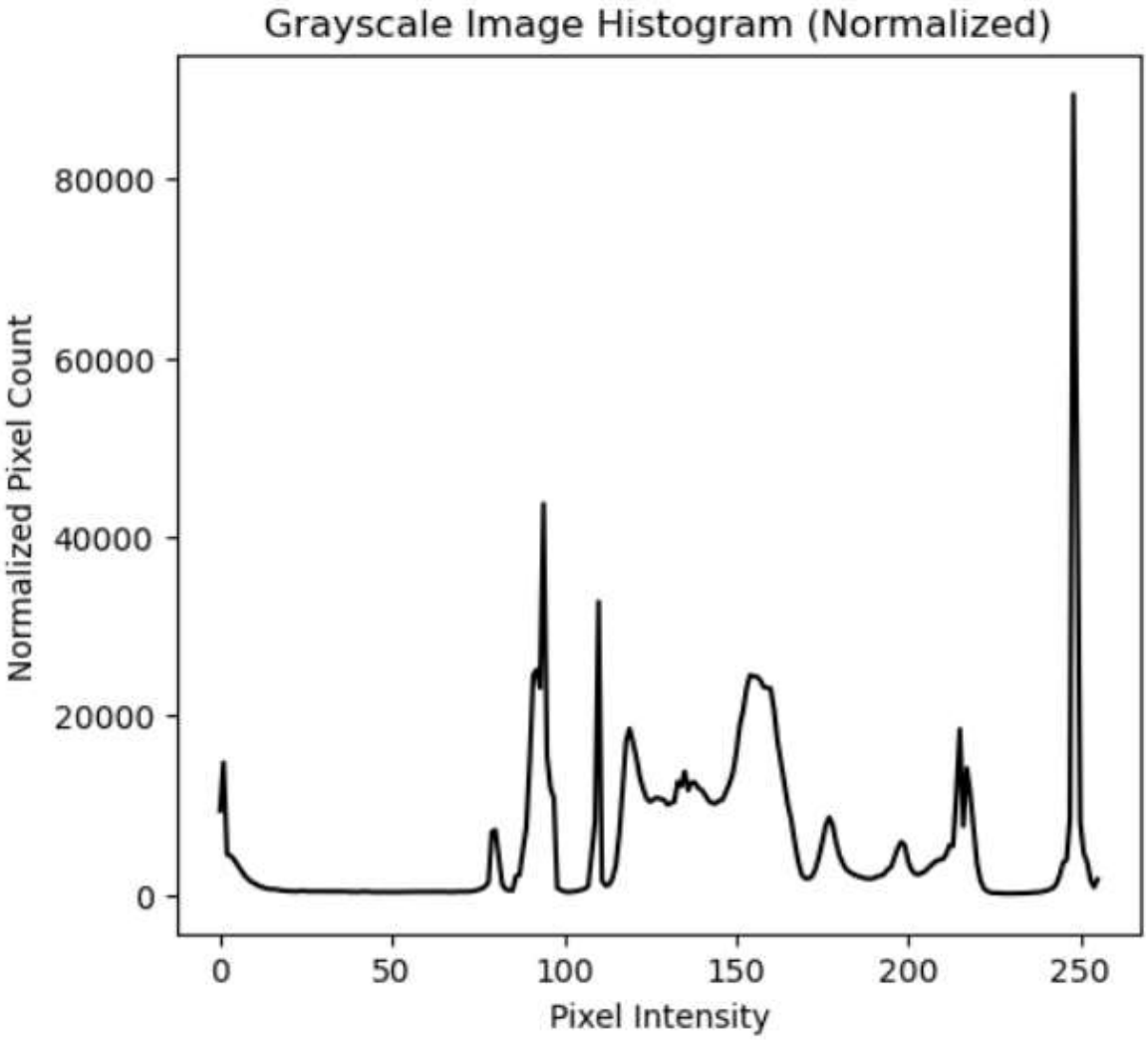
Output:

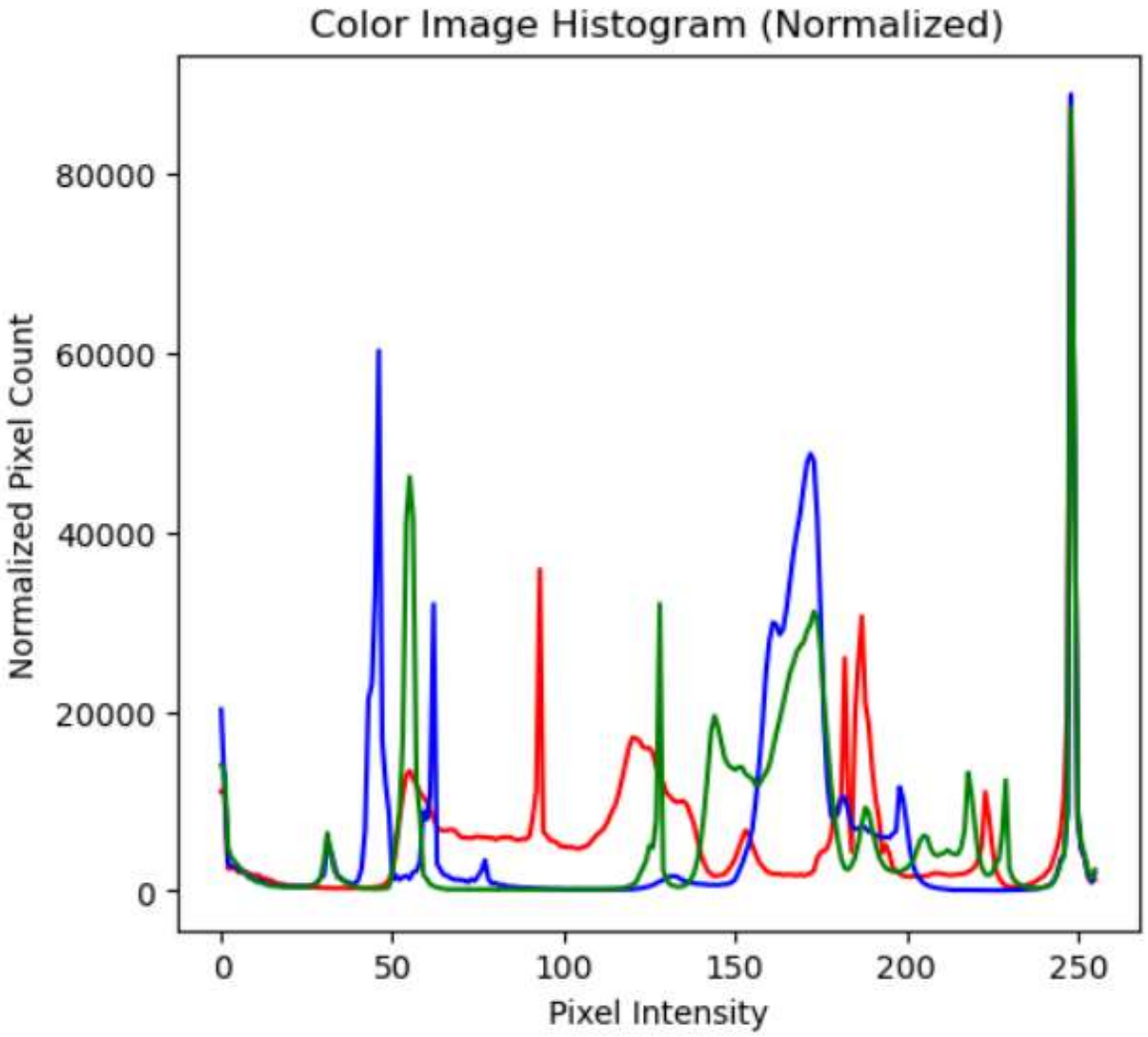
Input Grayscale Image and Color Image



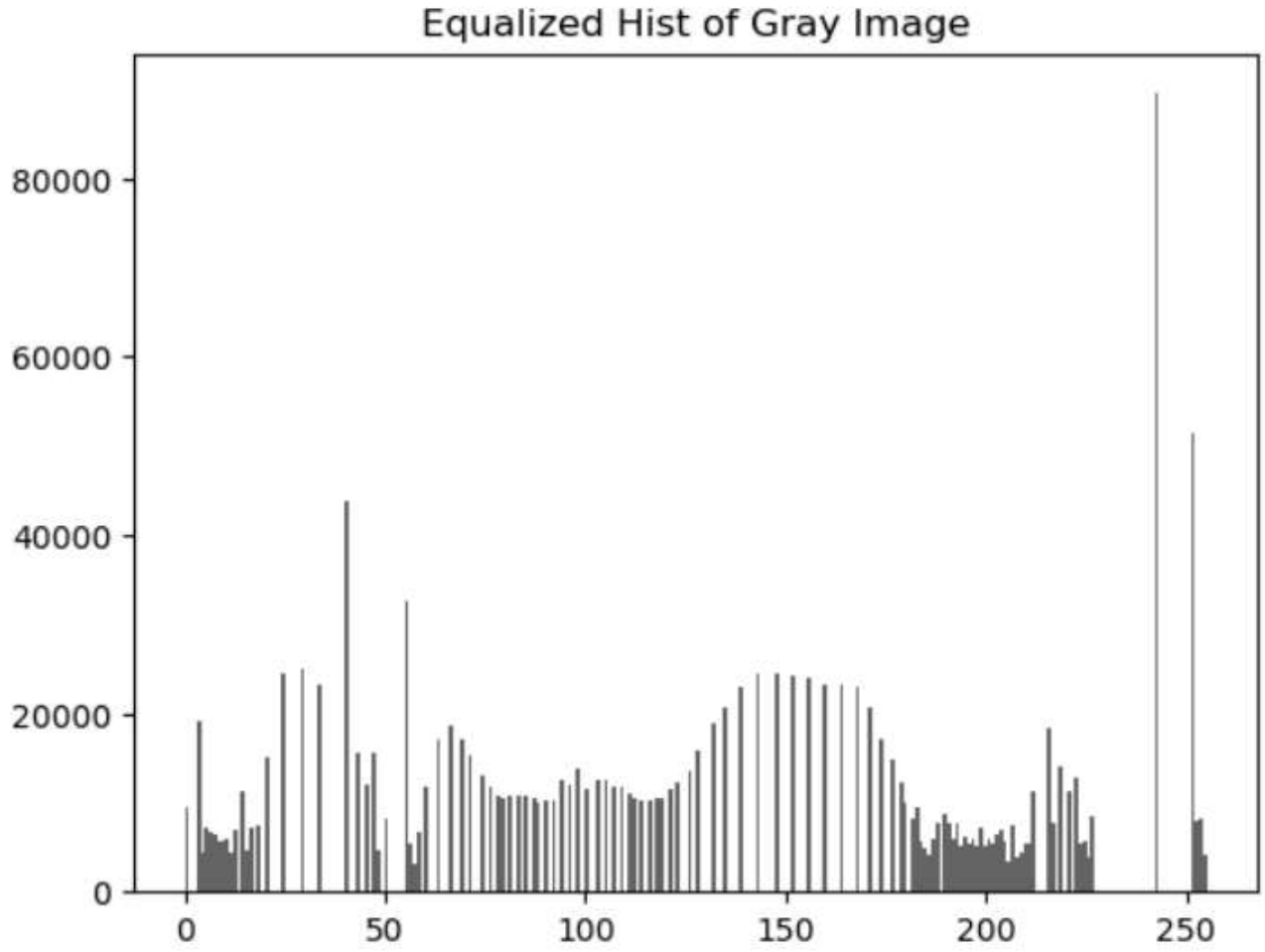


Histogram of Grayscale Image and any channel of Color Image





Histogram Equalization of Grayscale Image.



Result:

Thus the histogram for finding the frequency of pixels in an image with pixel values ranging from 0 to 255 is obtained. Also,histogram equalization is done for the gray scale image using OpenCV.