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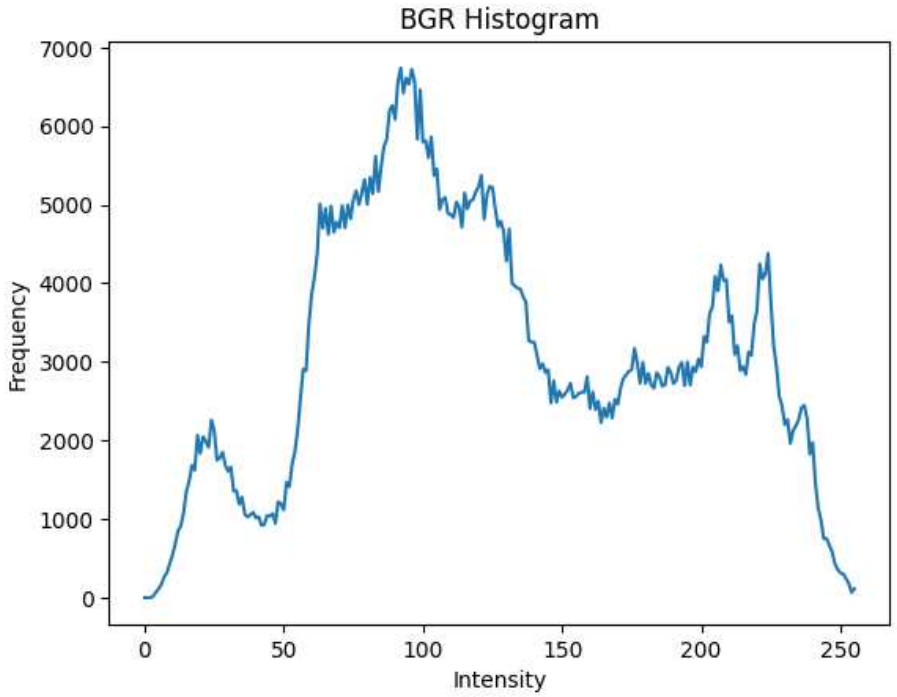
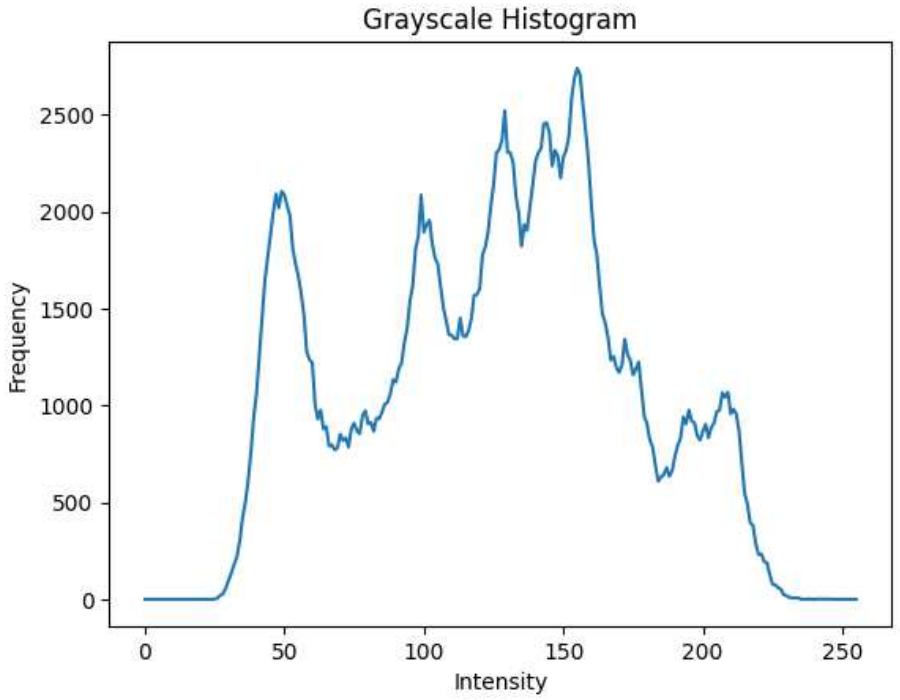
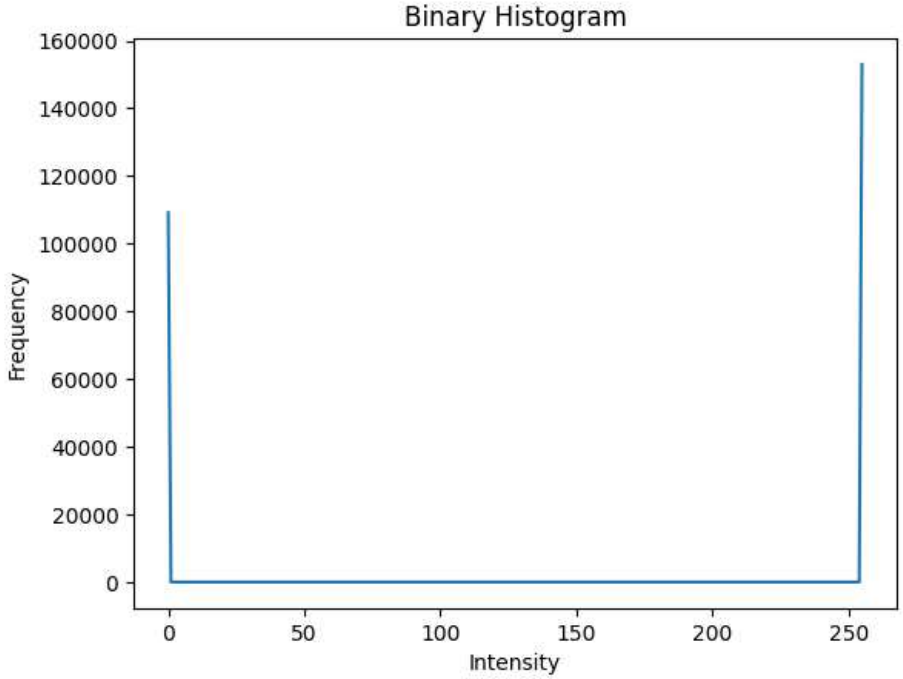
Kelas : Informatika B

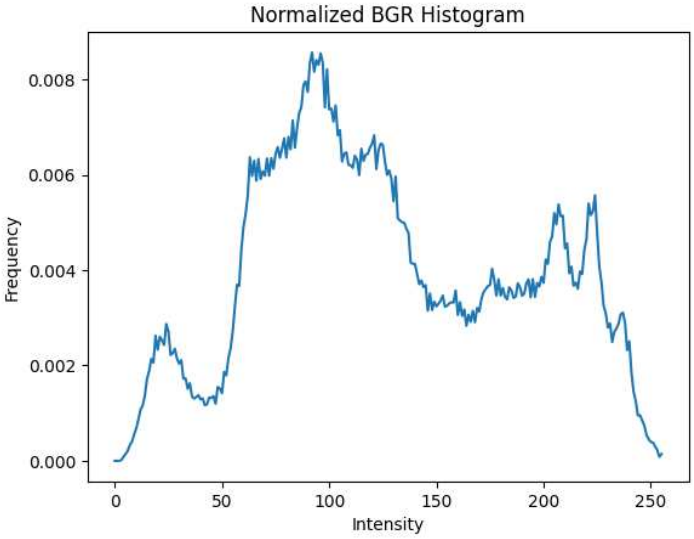
```
import cv2
import matplotlib.pyplot as plt
import numpy as np
from google.colab import drive

# Mount Google Drive
drive.mount('/content/gdrive')

# Load image from Google Drive
img_path = '/content/gdrive/MyDrive/lena_color.tiff'
img = cv2.imread(img_path)

# Convert image to Grayscale
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

# Convert image to Binary
_, binary = cv2.threshold(gray, 0, 255, cv2.THRESH_BINARY +
cv2.THRESH_OTSU)

def hitung_statistik(img):
    mean = np.mean(img)
    var = np.var(img)
    std = np.std(img)
    return mean, var, std

def plot_histogram(img, title, normalized=False):
    hist, bins = np.histogram(img.ravel(), 256, [0, 256])
    if normalized:
        hist = hist / hist.sum()
    plt.plot(bins[:-1], hist)
    plt.title(title)
    plt.xlabel('Intensity')
    plt.ylabel('Frequency')
    plt.show()

# Calculate statistics for each image
mean_bgr, var_bgr, std_bgr = hitung_statistik(img)
mean_gray, var_gray, std_gray = hitung_statistik(gray)
mean_binary, var_binary, std_binary = hitung_statistik(binary)
```

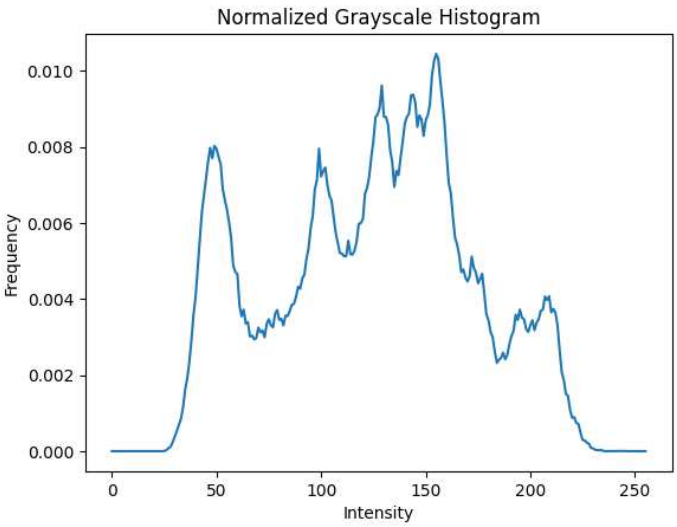
```
# Plot histogram for each image
plot_histogram(img, 'BGR Histogram')
plot_histogram(gray, 'Grayscale Histogram')
plot_histogram(binary, 'Binary Histogram')

# Plot normalized histogram for each image
plot_histogram(img, 'Normalized BGR Histogram', normalized=True)
plot_histogram(gray, 'Normalized Grayscale Histogram', normalized=True)
plot_histogram(binary, 'Normalized Binary Histogram', normalized=True)

# Print statistics for each image
print('BGR Image Statistics:')
print(f'Mean: {mean_bgr:.2f}, Variance: {var_bgr:.2f}, Standard Deviation:
{std_bgr:.2f}')
print('Grayscale Image Statistics:')
print(f'Mean: {mean_gray:.2f}, Variance: {var_gray:.2f}, Standard
Deviation: {std_gray:.2f}')
print('Binary Image Statistics:')
print(f'Mean: {mean_binary:.2f}, Variance: {var_binary:.2f}, Standard
Deviation: {std_binary:.2f}')
```

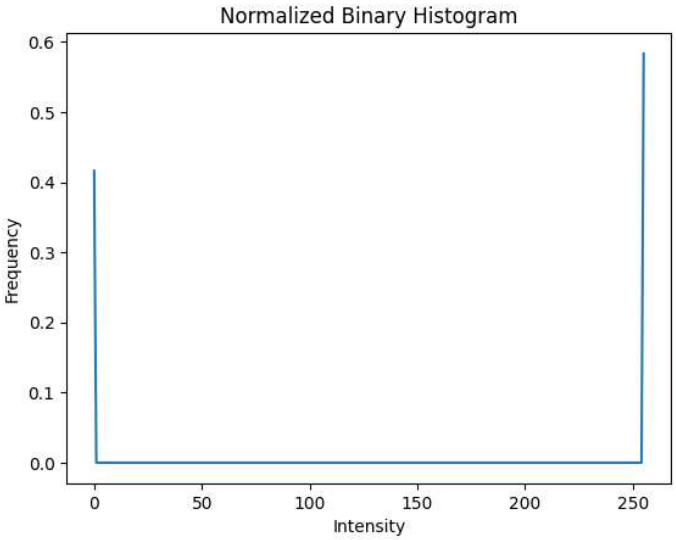



Grayscale Histogram
Frequency
Intensity
0
500
1000
1500
2000
2500
0
50
100
150
200
250


Binary Histogram
Frequency
Intensity
0
20000
40000
60000
80000
100000
120000
140000
160000
0
50
100
150
200
250


Normalized BGR Histogram
Frequency
Intensity
0.000
0.002
0.004
0.006
0.008
0
50
100
150
200
250


Normalized Grayscale Histogram
Frequency
Intensity
0.000
0.002
0.004
0.006
0.008
0.010
0
50
100
150
200
250


Normalized Binary Histogram
Frequency
Intensity
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
50
100
150
200
250