In [ ]:
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from PIL import Image
import matplotlib.pyplot as plt
import numpy as np

# Read the image
image_path = "bacteria.png"  # Update with your image path
image = Image.open(image_path)

ci_array = np.array(image)
flattened_array = ci_array.flatten()

# Plot original image
plt.subplot(2, 1, 1)
plt.imshow(image)
plt.title("Original Image")
plt.axis("off")


plt.figure(figsize=(8, 6))
plt.hist(flattened_array, bins=256, range=(0, 255), histtype='step', color='blac
plt.title("Histogram of Color Image")
plt.xlabel("Pixel Value")
plt.ylabel("Frequency")
plt.show()

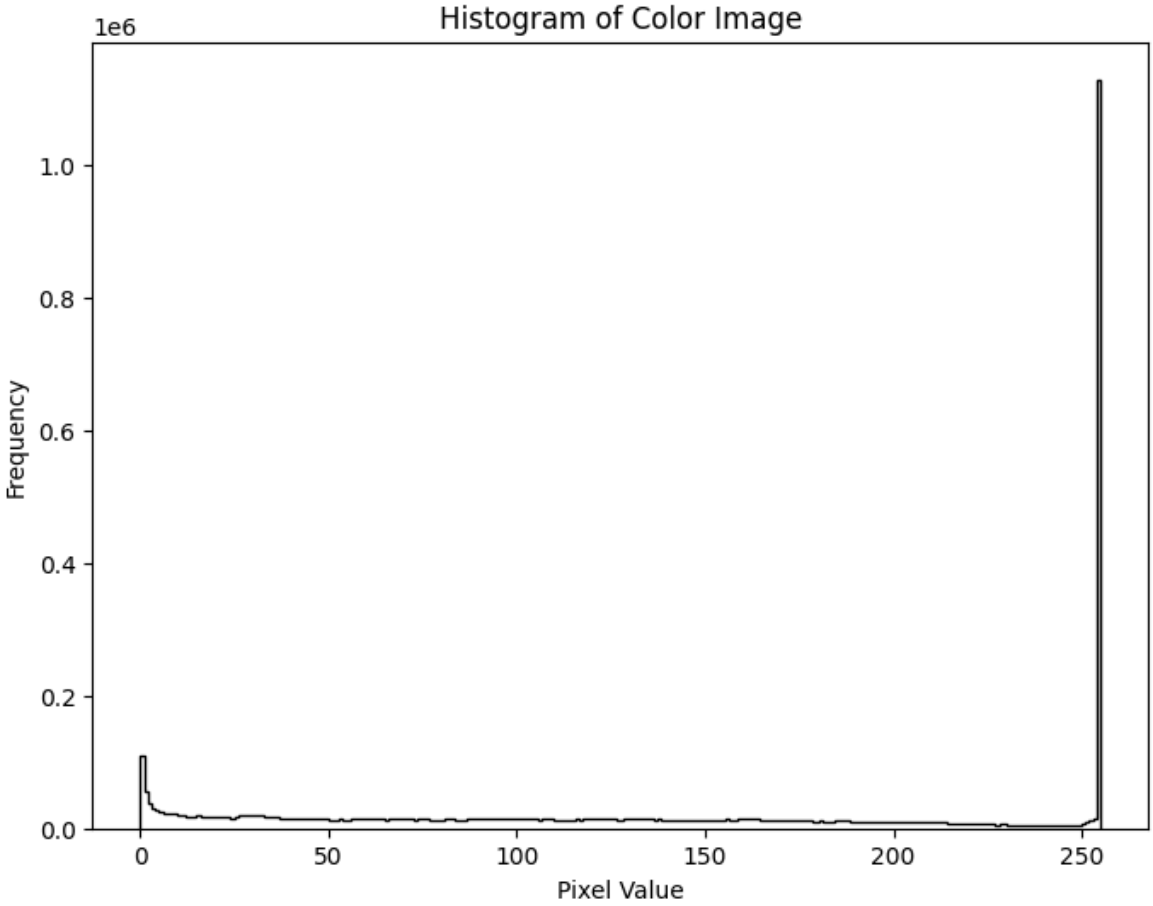
# Convert the image to black and white
bw_image = image.convert("L")
# Convert the image to a NumPy array
bw_array = np.array(bw_image)

# Flatten the array
flattened_array = bw_array.flatten()

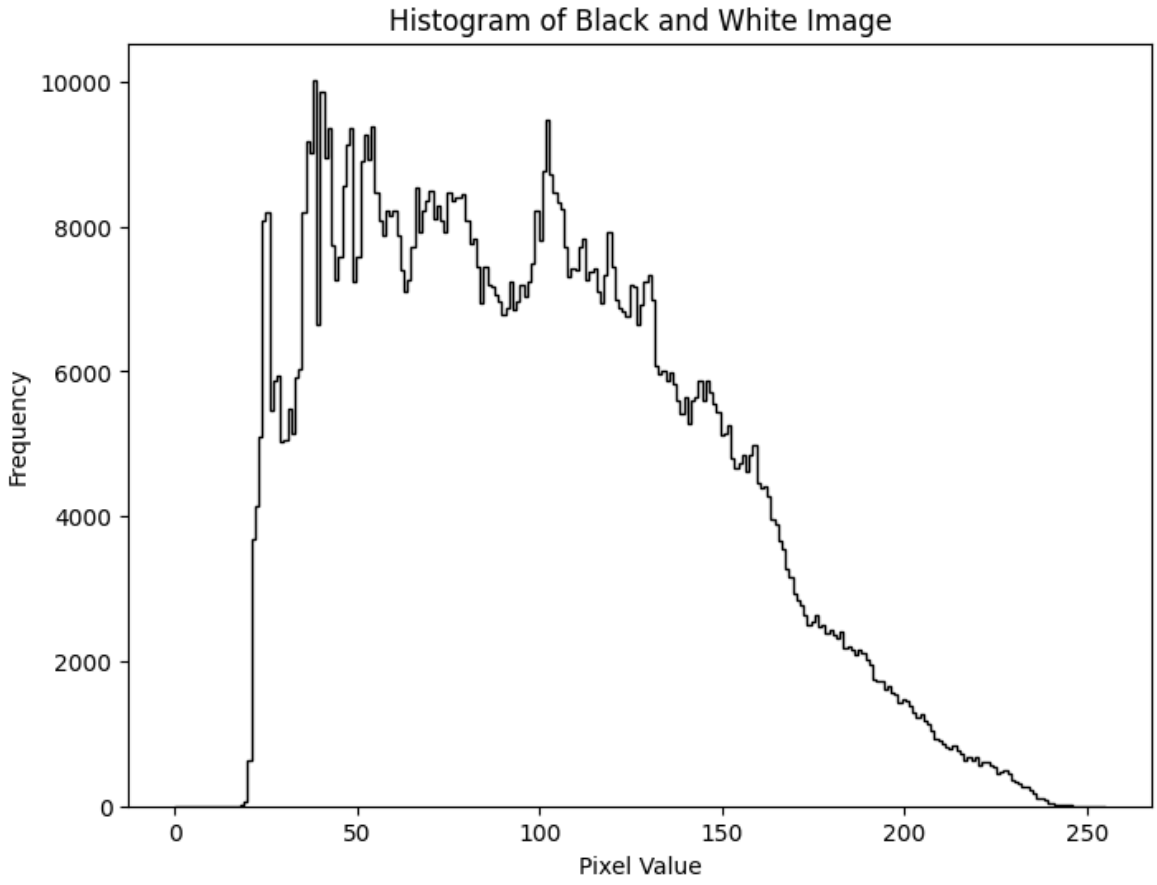
# Plot black and white image
plt.subplot(2, 1, 2)
plt.imshow(bw_image, cmap="gray")
plt.title("Black and White Image")
plt.axis("off")

# Visualize the histogram
plt.figure(figsize=(8, 6))
plt.hist(flattened_array, bins=256, range=(0, 255), histtype='step', color='blac
plt.title("Histogram of Black and White Image")
plt.xlabel("Pixel Value")
plt.ylabel("Frequency")
plt.show()
```

Original Image



Black and White Image


Histogram of Black and White Image
Frequency
Pixel Value
0
2000
4000
6000
8000
10000
0
50
100
150
200
250