```
!pip install opencv-python matplotlib
```

```
Requirement already satisfied: opencv-python in /usr/local/lib/python3.10/dist-packages (4.10.0.84)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (3.7.1)
Requirement already satisfied: numpy>=1.21.2 in /usr/local/lib/python3.10/dist-packages (from opencv-python) (1.26.4)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (4.53.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.4.5)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

```
import cv2
import matplotlib.pyplot as plt
```

```
from google.colab import files
```

+ Code + Text

```
uploaded = files.upload()
```

Choose Files No file chosen Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

```
Saving X-Ray2.jfif to X-Ray2.jfif
```

```
image = cv2.imread(r'X-Ray2.jfif')
```

```
import cv2
from google.colab.patches import cv2_imshow # Import cv2_imshow from patches

image = cv2.imread(r'X-Ray2.jfif')
cv2_imshow(image) # Now you can use cv2_imshow
```

```
new_width = 300
new_height = 200
resized_image = cv2.resize(image, (new_width, new_height))
```

```
plt.figure(figsize=(10, 5))
```

```
<Figure size 1000x500 with 0 Axes>
<Figure size 1000x500 with 0 Axes>
```

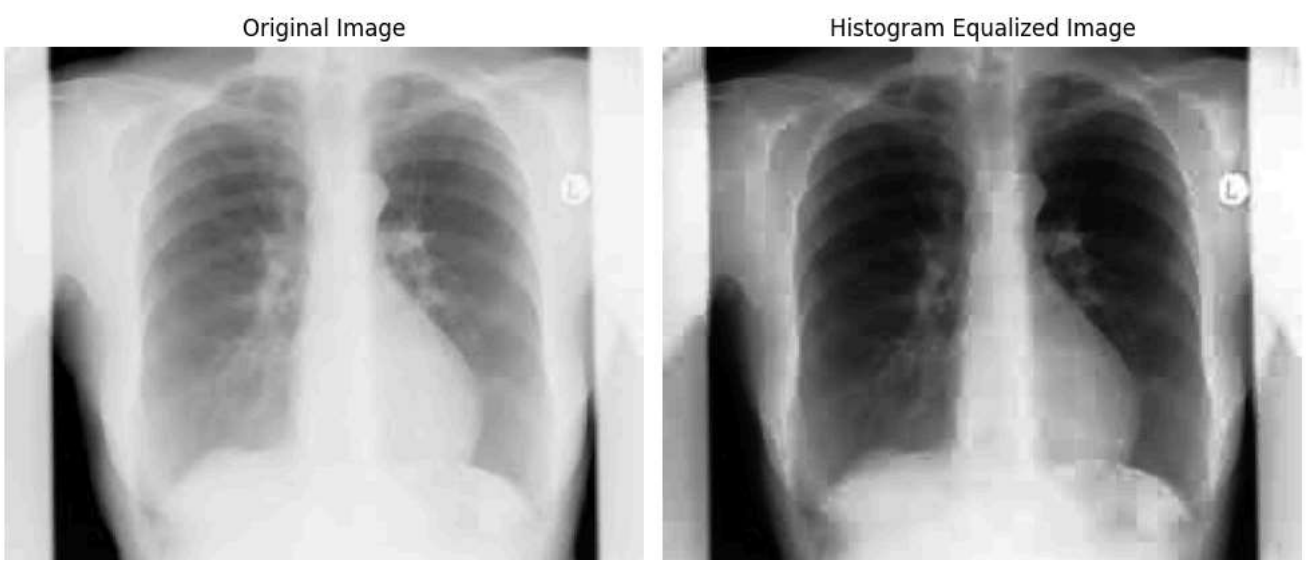
```
# Load the medical gray image
image_path = r'X-Ray2.jfif'  # Replace with your image path
img = cv2.imread(image_path, cv2.IMREAD_GRAYSCALE)

if img is None:
    print("Error: Could not load image. Check the file path.")
else:
    # Perform Histogram Equalization
    equ = cv2.equalizeHist(img)
```

```
equ = cv2.equalizeHist(img)
```

```
 # Display results
 plt.figure(figsize=(10, 5))
 plt.subplot(1, 2, 1)
 plt.imshow(img, cmap='gray')
 plt.title('Original Image')
 plt.axis('off')
 plt.subplot(1, 2, 2)
 plt.imshow(equ, cmap='gray')
```

```
plt.title('Histogram Equalized Image')
plt.axis('off')
plt.tight_layout()
plt.show()
```

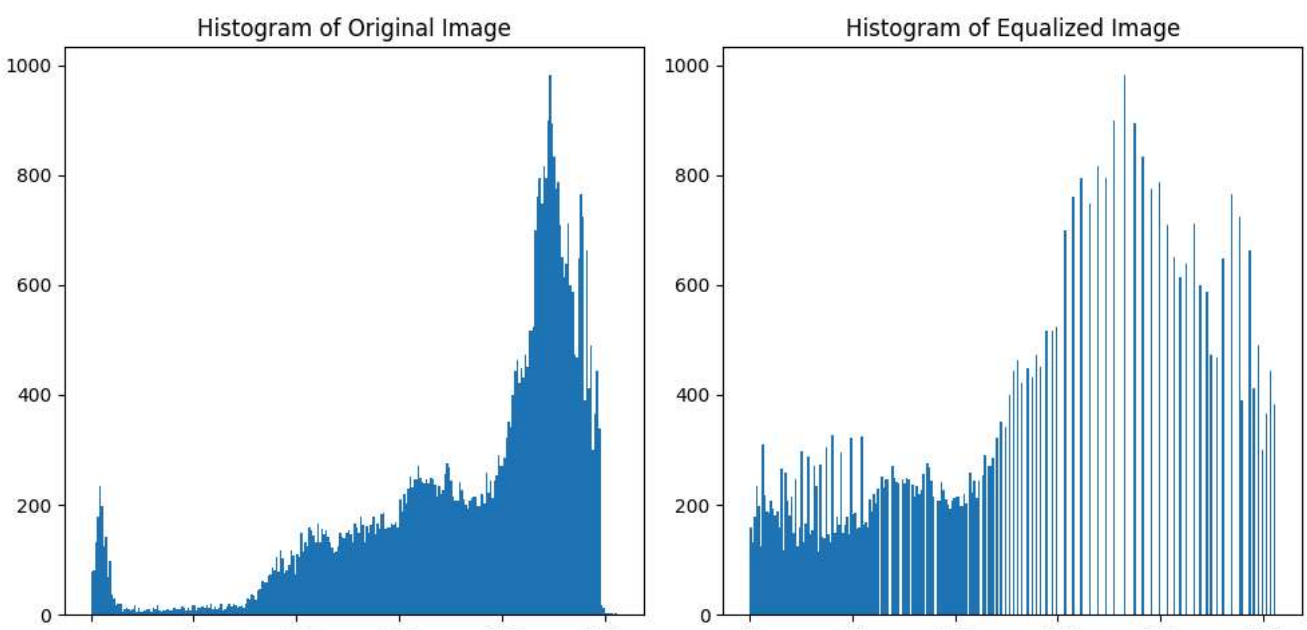



```
# Display histograms
plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)
plt.hist(img.ravel(), 256, [0, 256])
plt.title('Histogram of Original Image')

plt.subplot(1, 2, 2)
plt.hist(equ.ravel(), 256, [0, 256])
plt.title('Histogram of Equalized Image')

plt.tight_layout()
plt.show()
```




```
import cv2
import matplotlib.pyplot as plt


# Display histograms with styling
plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)
plt.hist(img.                                                    ravel(), 256, [0, 256], color='skyblue', edgecolor='green')
plt.title('Histogram of Original Image')
plt.xlabel('Pixel Intensity')
plt.ylabel('Frequency')

plt.subplot(1, 2, 2)
plt.hist(equ.ravel(), 256, [0, 256], color='green', edgecolor='red')
plt.title('Histogram of Equalized Image')
```

```
plt.xlabel('Pixel Intensity')
plt.ylabel('Frequency')

plt.tight_layout()
plt.show()
```