

```

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

uploaded = files.upload()

filename = list(uploaded.keys())[0]

img = cv2.imread(filename, cv2.IMREAD_GRAYSCALE)

laplacian_kernel = np.array([[0, 1, 0],
                             [1, -4, 1],
                             [0, 1, 0]])

laplacian = cv2.filter2D(img, -1, laplacian_kernel)

sharpened = cv2.subtract(img, laplacian)

plt.figure(figsize=(12, 4))
plt.subplot(1, 3, 1)
plt.title('Original')
plt.imshow(img, cmap='gray')
plt.axis('off')

plt.subplot(1, 3, 2)
plt.title('Laplacian')
plt.imshow(laplacian, cmap='gray')
plt.axis('off')

plt.subplot(1, 3, 3)
plt.title('Sharpened')
plt.imshow(sharpened, cmap='gray')
plt.axis('off')

plt.tight_layout()
plt.show()

```



Choose Files i20.PNG

- **i20.PNG**(image/png) - 158163 bytes, last modified: 5/9/2025 - 100% done

Saving i20.PNG to i20.PNG

Original



Laplacian



Sharpened



