17.

import cv2

import numpy as np

import matplotlib.pyplot as plt

from google.colab import files

uploaded = files.upload()

image\_path = next(iter(uploaded))

img = cv2.imread(image\_path, cv2.IMREAD\_GRAYSCALE)

sobel\_x = cv2.Sobel(img, cv2.CV\_64F, dx=1, dy=0, ksize=3) # X-direction

sobel\_x = np.absolute(sobel\_x) # Take absolute for better visualization

sobel\_x = np.uint8(np.clip(sobel\_x, 0, 255)) # Convert to 8-bit

plt.figure(figsize=(10, 4))

plt.subplot(1, 2, 1)

plt.title("Original Grayscale Image")

plt.imshow(img, cmap='gray')

plt.subplot(1, 2, 2)

plt.title("Sobel Edge Detection (X-axis)")

plt.imshow(sobel\_x, cmap='gray')

plt.show()

OUTPUT:

