15. Perform Edge detection using Sobel Matrix along XY axis

PROGRAM:

EXP-15.py - C:\Users\reddy\OneDrive\Desktop\COMPUTER VISION\EXP-15.py (3.11.9)

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```
import cv2
import numpy as np

# Read image
img = cv2.imread(r"C:\Users\reddy\OneDrive\Desktop\COMPUTER VISION\iii.jpg")

if img is None:
    print("Image not found")
    exit()

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

# Sobel along X-axis
sobelx = cv2.Sobel(gray, cv2.CV_64F, 1, 0, ksize=3)

# Sobel along Y-axis
sobely = cv2.Sobel(gray, cv2.CV_64F, 0, 1, ksize=3)

# Combine X and Y (Gradient Magnitude)
sobel_xy = np.sqrt(sobelx**2 + sobely**2)

# Convert to absolute scale
sobel_xy = cv2.convertScaleAbs(sobel_xy)

# Display images
cv2.imshow("Original Image", img)
cv2.imshow("Sobel XY Edge Detection", sobel_xy)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

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OUTPUT: