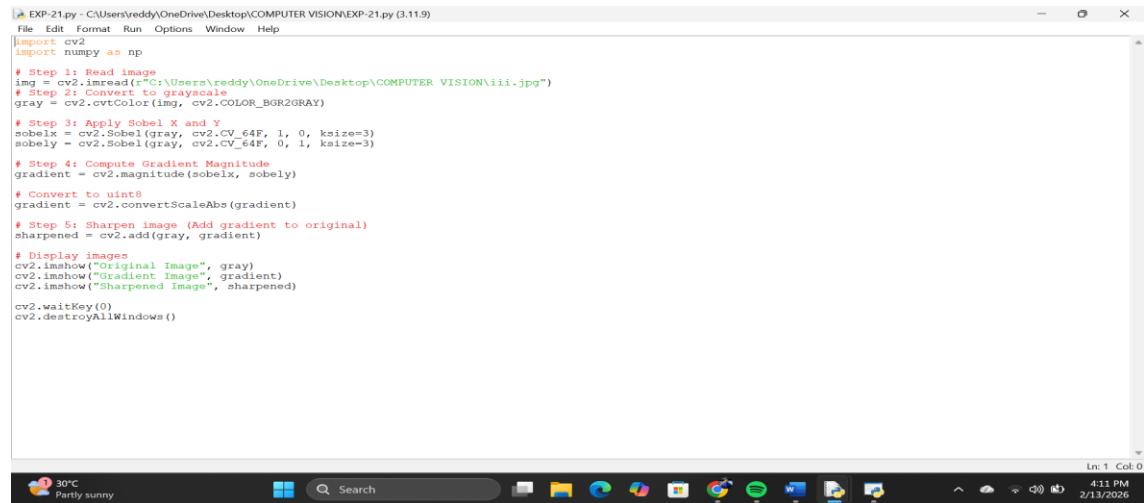


21. Perform Sharpening of Image using Gradient masking.

PROGRAM:



```
EXP-21.py - C:\Users\reddy\OneDrive\Desktop\COMPUTER VISION\EXP-21.py (3.11.9)
File Edit Format Run Options Window Help
import cv2
import numpy as np

# Step 1: Read image
img = cv2.imread(r"C:\Users\reddy\OneDrive\Desktop\COMPUTER VISION\iii.jpg")
# Step 2: Convert to grayscale
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

# Step 3: Apply Sobel X and Y
sobelx = cv2.Sobel(gray, cv2.CV_64F, 1, 0, ksize=3)
sobely = cv2.Sobel(gray, cv2.CV_64F, 0, 1, ksize=3)

# Step 4: Compute Gradient Magnitude
gradient = cv2.magnitude(sobelx, sobely)

# Convert to uint8
gradient = cv2.convertScaleAbs(gradient)

# Step 5: Sharpen image (Add gradient to original)
sharpened = cv2.add(gray, gradient)

# Display images
cv2.imshow("Original Image", gray)
cv2.imshow("Gradient Image", gradient)
cv2.imshow("Sharpened Image", sharpened)

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

OUTPUT:

