CODE:

```
import cv2

import numpy as np


# Step 1: Read the image

image_path = (r"C:\Users\harik\Downloads\CV LAB\MOUNTAIN.jpeg") # Replace with your image path

img = cv2.imread(image_path)

gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)


# Step 2: Apply Sobel operator in X and Y direction

sobel_x = cv2.Sobel(gray, cv2.CV_64F, 1, 0, ksize=3)

sobel_y = cv2.Sobel(gray, cv2.CV_64F, 0, 1, ksize=3)


# Step 3: Combine the two gradients

sobel_combined = cv2.magnitude(sobel_x, sobel_y)

sobel_combined = cv2.convertScaleAbs(sobel_combined)


# Step 4: Display the results

cv2.imshow("Original Image", img)

cv2.imshow("Sobel X", cv2.convertScaleAbs(sobel_x))

cv2.imshow("Sobel Y", cv2.convertScaleAbs(sobel_y))

cv2.imshow("Sobel Edge Detection", sobel_combined)


cv2.waitKey(0)

cv2.destroyAllWindows()


# Step 5: Save the output

cv2.imwrite("sobel_edge_output.jpg", sobel_combined)
```

OUTPUT: