```
# -*- coding: utf-8 -*-
"""
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"""

import cv2 as cv
import matplotlib.pyplot as plt
import numpy as np
import math

def clip(img):
    m = img.shape[0]
    n = img.shape[1]
    for i in range(m):
        for j in range(n):
            if img[i][j] > 255:
                img[i][j] = 255
            if img[i][j] < 0:
                img[i][j] = 0
    return img.astype(np.float32)

path = "/content/drive/MyDrive/vision/New folder/ein.jpg"

img = cv.imread(path)

img = cv.cvtColor(img,cv.COLOR_BGR2GRAY)

img = cv.resize(img,(400,400))

plt.imshow(img,'gray')

plt.title("Input for sobel: ")

plt.show()

kernel = np.array([[-1,0,1],[-2,0,2],[-1,0,1]),np.float32)
```

```
kernel = np.array(([-1,0,1],[-2,0,2],[-1,0,1]),np.float32)

a = kernel.shape[0] // 2
b = kernel.shape[1] // 2

m = img.shape[0]
n = img.shape[1]

op1 = np.zeros((m,n),np.float32)

for i in range(m):
    for j in range(n):
        for x in range(-a,a+1):
            for y in range(-b,b+1):
                if i-x>=0 and i-x<m and j-y>=0 and j-y<n:
                    op1[i][j]+=kernel[a+x][b+y]*img[i-x][j-y]
                else:
                    op1[i][j]+=0

plt.imshow(op1,'gray')

plt.title("Sobel vertical filtered: ")

plt.show()

op1 = clip(op1)

plt.imshow(op1,'gray')

plt.title("Sobel vertical clipped: ")

plt.show()

op2 = np.zeros((m,n),np.float32)

kernel = np.array(([-1,-2,-1],[0,0,0],[1,2,1]),np.float32)

for i in range(m):
    for j in range(n):
        for x in range(-a,a+1):
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            for x in range(-a,a+1):
                for y in range(-b,b+1):
                    if i-x>=0 and i-x<m and j-y>=0 and j-y<n:
                        op2[i][j]+=kernel[a+x][b+y]*img[i-x][j-y]
                    else:
                        op2[i][j]+=0

    plt.imshow(op2,'gray')

    plt.title("Sobel horizontal filtered: ")

    plt.show()

    op1 = clip(op2)

    plt.imshow(op2,'gray')

    plt.title("Sobel horizontal clipped: ")

    plt.show()

    op2+=op1

    op2 = clip(op2)

    plt.imshow(op2,'gray')

    plt.title("Sobel added: ")

    plt.show()

    im_o = img+op2

    im_o = clip(im_o)

    plt.imshow(im_o,'gray')

    plt.title("Sobel enhanced:")

    plt.show()
```

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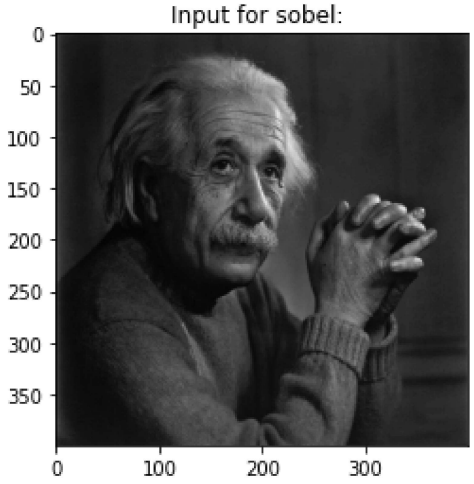
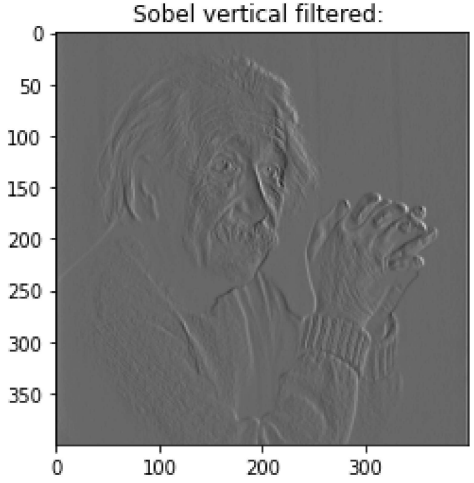
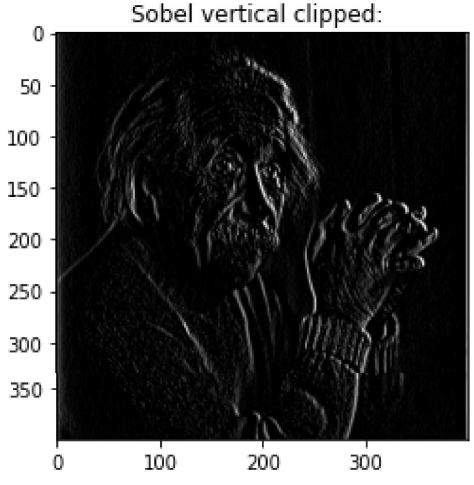
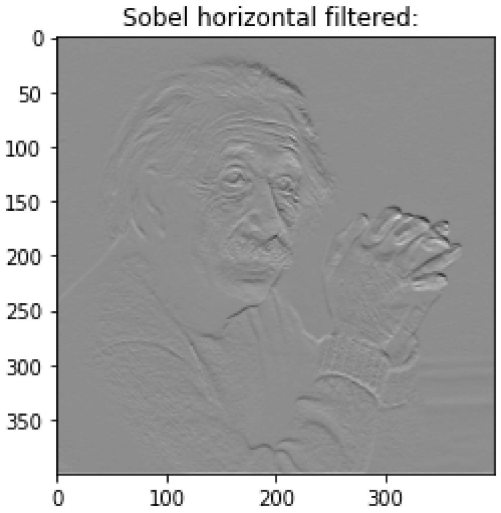
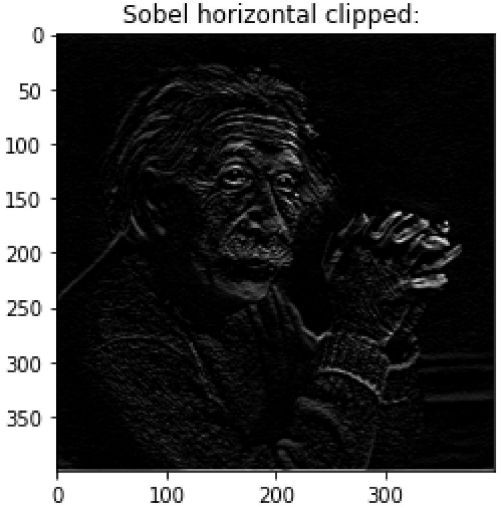
plt.show()
```

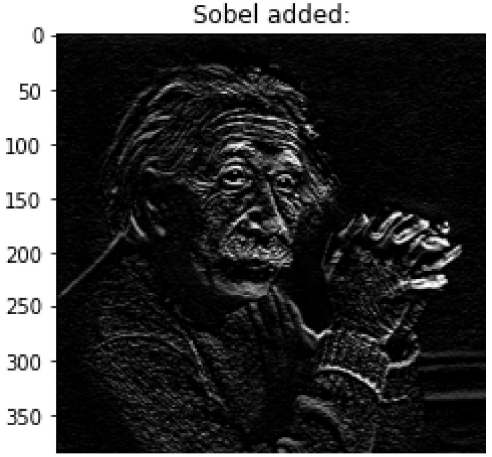

Input for sobel:
0
50
100
150
200
250
300
350
0
100
200
300

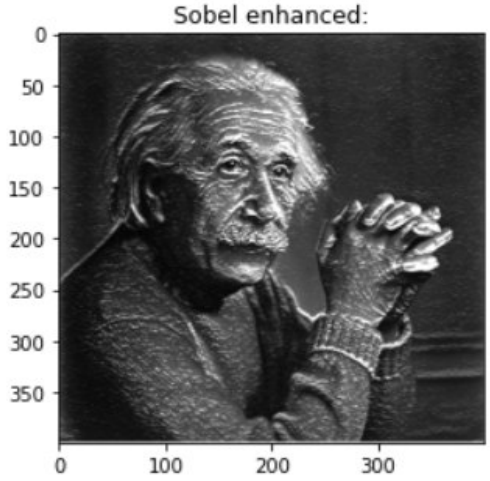

Sobel vertical filtered:
0
50
100
150
200
250
300
350
0
100
200
300


Sobel vertical clipped:
0
50
100
150
200
250
300
350
0
100
200
300


Sobel horizontal filtered:
0
50
100
150
200
250
300
350
0
100
200
300


Sobel horizontal clipped:
0
50
100
150
200
250
300
350
0
100
200
300


Sobel added:
0
50
100
150
200
250
300
350


Sobel enhanced:
0
50
100
150
200
250
300
350
0
100
200
300