classeval

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0.1 Om Shree

0.2 2006077

0.3 IT-2 T&TL Evaluation

[1]:
```
import cv2 as cv
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from google.colab.patches import cv2_imshow
import html5lib
```

0.4 Q1

Given state, find year-wise the district with highest crime rate.

[11]:
```
# Reading data for question-1 :-
df = pd.read_csv("ic.csv")
df.head()
```

[11]:
```
          STATEUT       DISTRICT  Year  Rape  KidnappingandAbduction  \
0  ANDHRA PRADESH       ADILABAD  2001    50                      30
1  ANDHRA PRADESH      ANANTAPUR  2001    23                      30
2  ANDHRA PRADESH       CHITTOOR  2001    27                      34
3  ANDHRA PRADESH       CUDDAPAH  2001    20                      20
4  ANDHRA PRADESH  EAST GODAVARI  2001    23                      26

   DowryDeaths  Assaultonwomenwithintenttooutragehermodesty  \
0           16                                          149
1            7                                          118
2           14                                          112
3           17                                          126
4           12                                          109

   InsulttomodestyofWomen  CrueltybyHusbandorhisRelatives  ImportationofGirls
0                      34                             175                   0
1                      24                             154                   0
2                      83                             186                   0
```

```
3                        38                              57                     0
4                        58                             247                     0
```

[33]:
```
# User input :-
state = input("Enter state name: ")

# Create a new aggregate feature 'crime' :-
cname = ['Rape', 'KidnappingandAbduction', 'DowryDeaths',
           'Assaultonwomenwithintenttooutragehermodesty',
           'InsulttomodestyofWomen', 'CrueltybyHusbandorhisRelatives',
           'ImportationofGirls']
df['crime'] = df[cname].sum(axis=1)

# Find district with max_crime :-
for x in range (1, 13):
    max = 0
    dis = ''
    for index, row in df.iterrows():
        if (row.STATEUT==state and row.Year==2000+x and
        row.DISTRICT!='TOTAL' and row.DISTRICT!='DELHI UT TOTAL'):
            if (row.crime) > max:
                max = row.crime
                dis = row.DISTRICT
    print("Year:", 2000+x, "\nDistrict : ",dis)
```

```
Enter state name: BIHAR
Year: 2001
District :  MUZAFFARPUR
Year: 2002
District :  MADHUBANI
Year: 2003
District :  MADHUBANI
Year: 2004
District :  VAISHALI
Year: 2005
District :  PATNA
Year: 2006
District :  PATNA
Year: 2007
District :  PATNA
Year: 2008
District :  PATNA
Year: 2009
District :  PATNA
Year: 2010
District :  PATNA
Year: 2011
```

```
District :  DARBHANGA
Year: 2012
District :  PATNA
```

0.5 Q2

Find the state which imporoved the most year on year

[37]:
```
# Best state which improved crime record year by year
grouped_data = df.groupby(['STATEUT', 'Year']).sum()
grouped_data['Total'] = grouped_data.sum(axis=1)
grouped_data['% Change'] = grouped_data.groupby(['STATEUT'])['Total'].
  ↪pct_change()

state_best_imprv = grouped_data.groupby(['STATEUT'])['% Change'].agg('sum').
  ↪idxmin()
print('State with best crime record improvement: ', state_best_imprv)
```

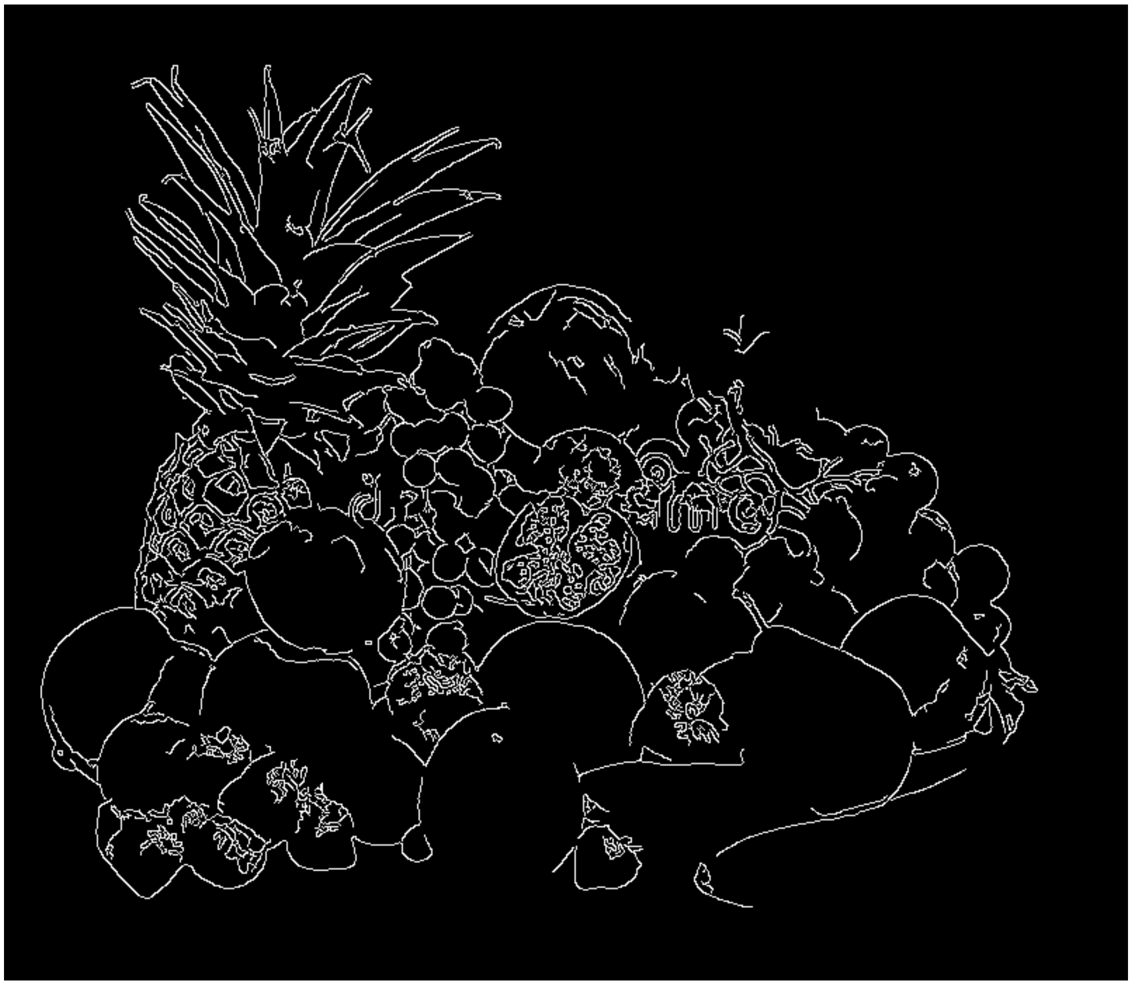
```
State with best crime record improvement:  PUDUCHERRY
```

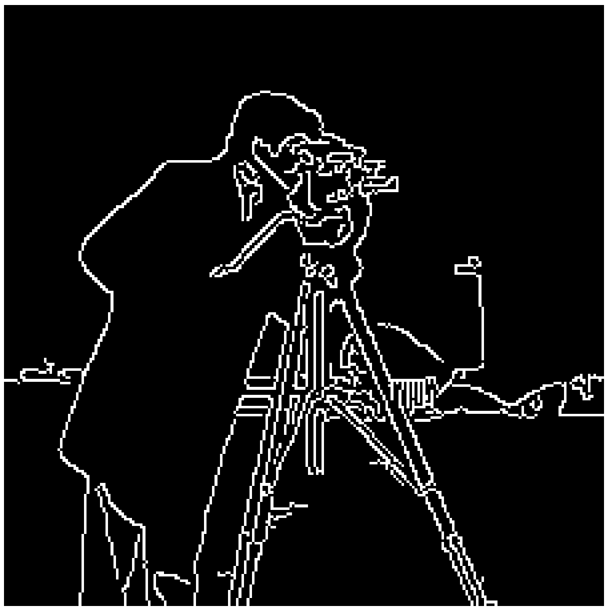
0.6 Q3

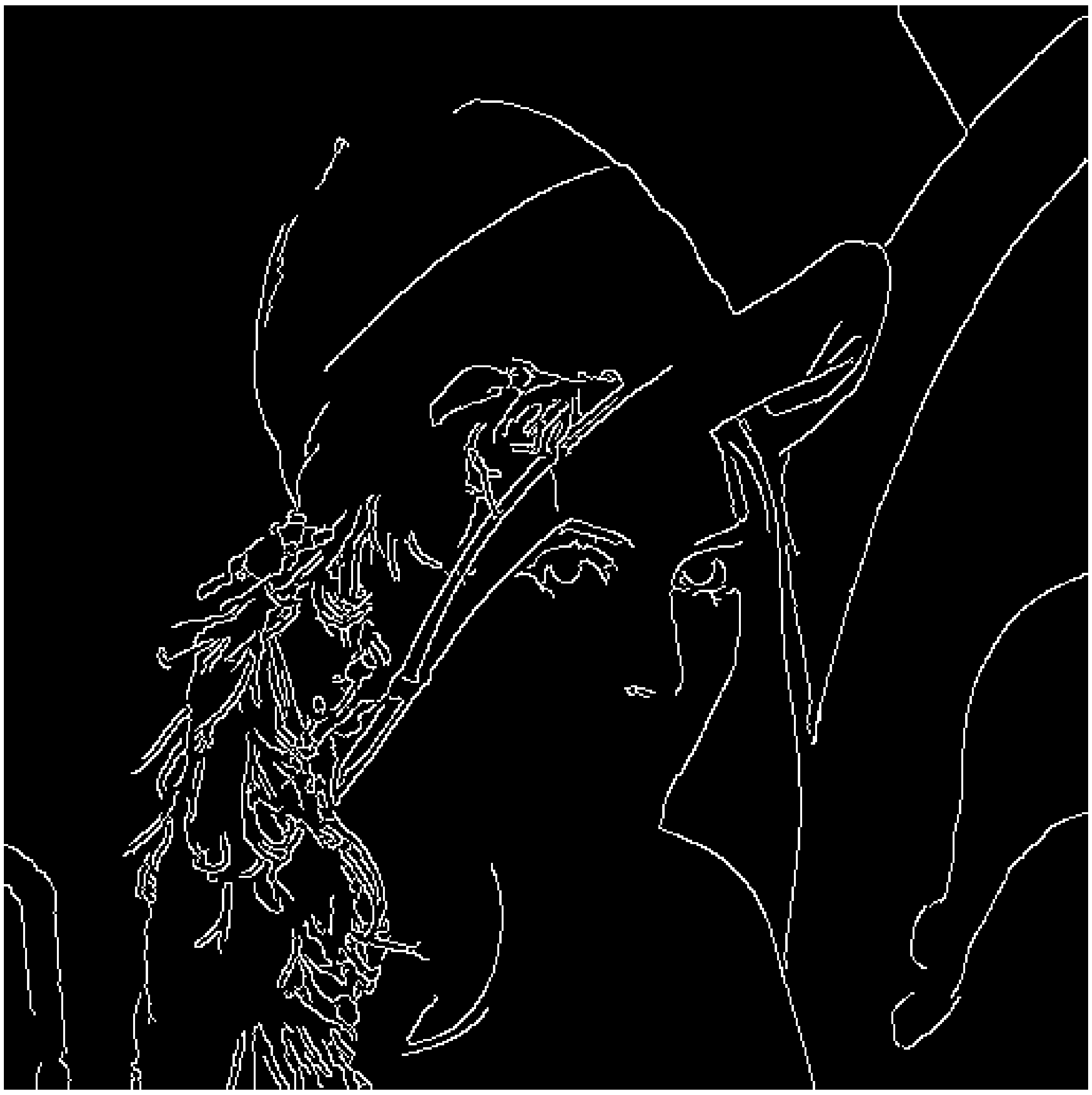
Canny Edge detection

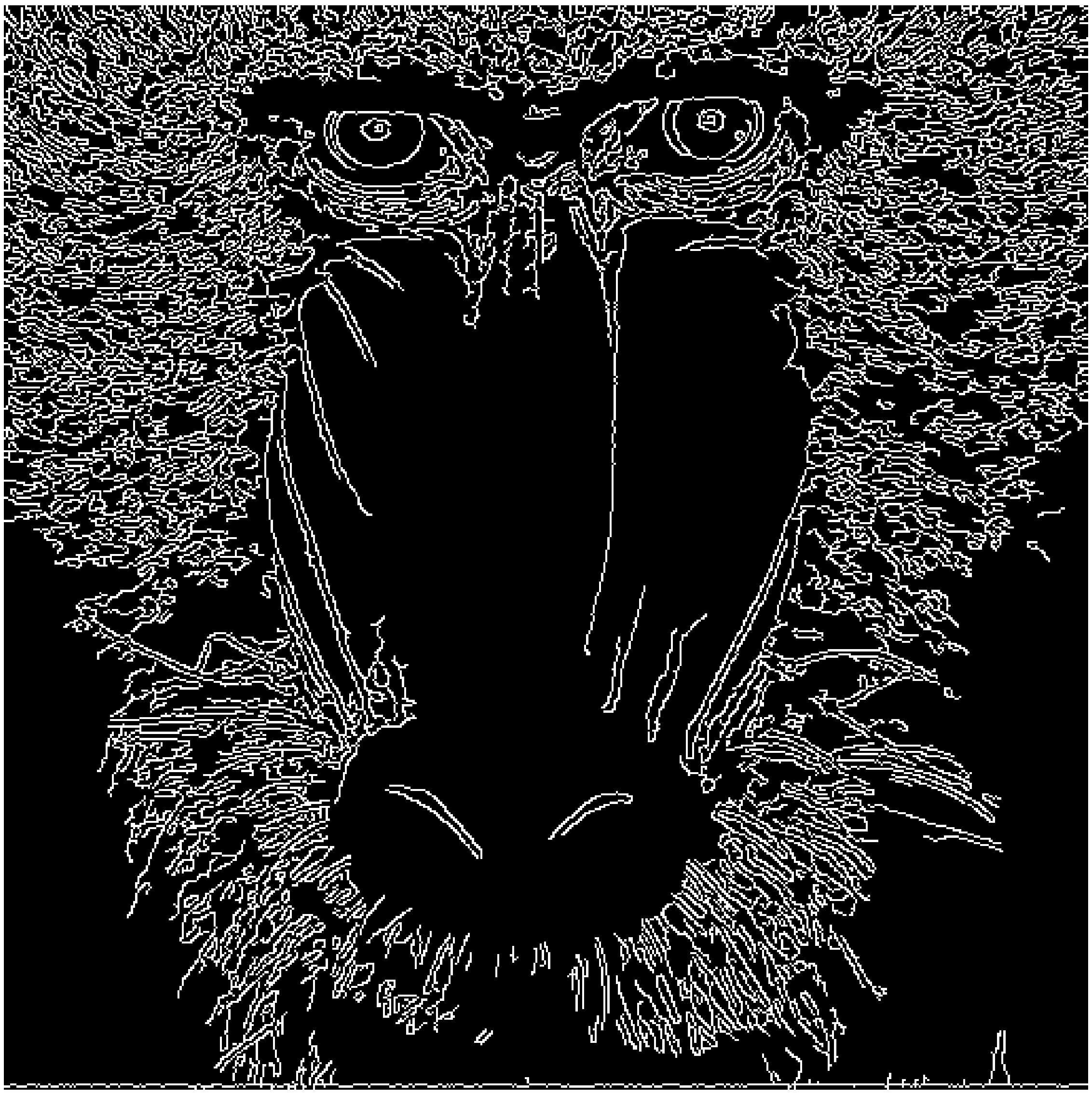
[34]:
```
# Canny edge detection :-

# Read the image :-
img1 = cv.imread('original/fruit.jpg', 0)
img2 = cv.imread('original/index.jpg', 0)
img3 = cv.imread('original/Lenna.png', 0)
img4 = cv.imread('original/baboon.png', 0)

# Apply a low-pass filter :-
kernel = np.ones((3, 3), np.float32) / 9
dst1 = cv.filter2D(img1, -1, kernel)
dst2 = cv.filter2D(img2, -1, kernel)
dst3 = cv.filter2D(img3, -1, kernel)
dst4 = cv.filter2D(img4, -1, kernel)

# Apply Canny edge detection :-
edges1 = cv.Canny(dst1, 70, 200)
edges2 = cv.Canny(dst2, 70, 200)
edges3 = cv.Canny(dst3, 70, 200)
edges4 = cv.Canny(dst4, 70, 200)

# Show the images :-
cv2_imshow(edges1)
cv2_imshow(edges2)
```

```
cv2_imshow(edges3)
cv2_imshow(edges4)
```







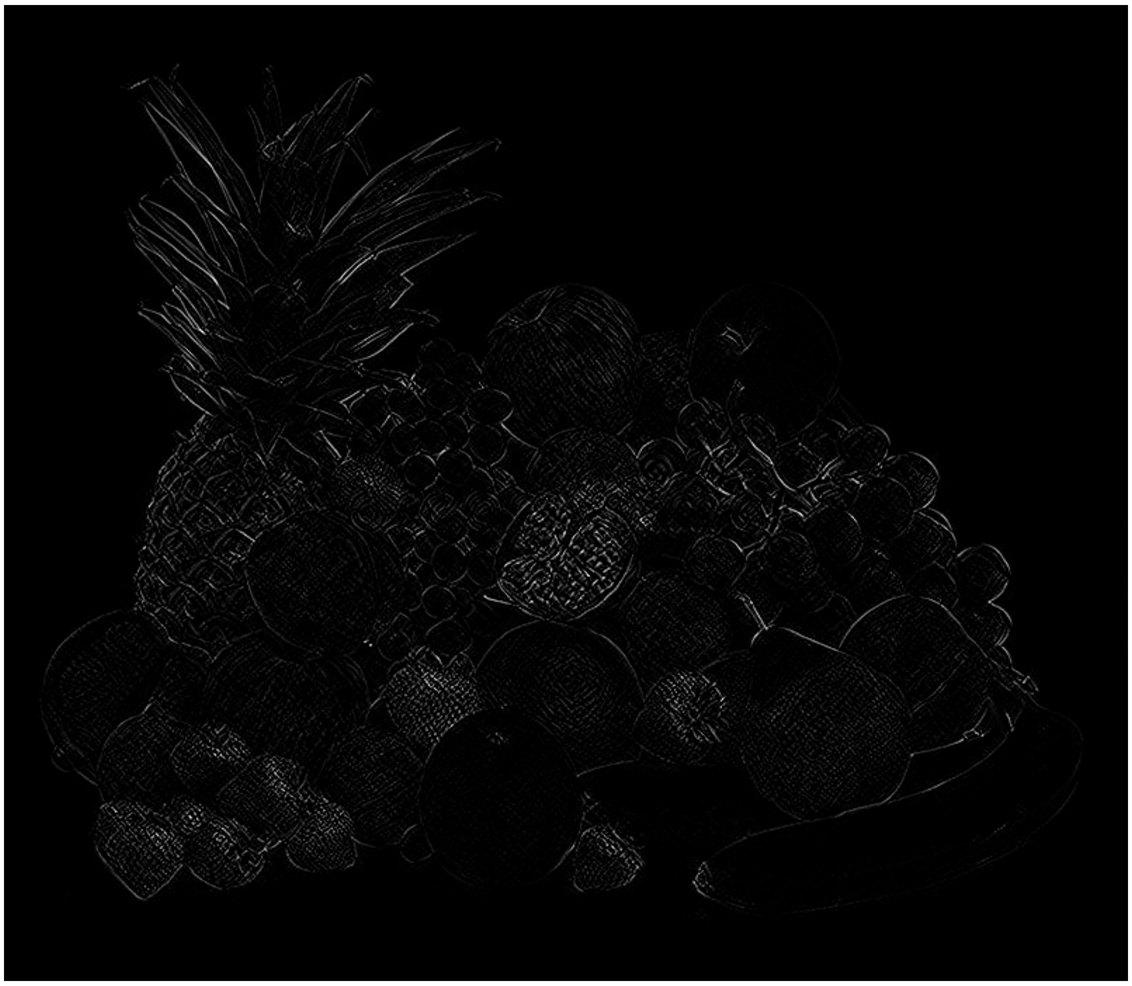


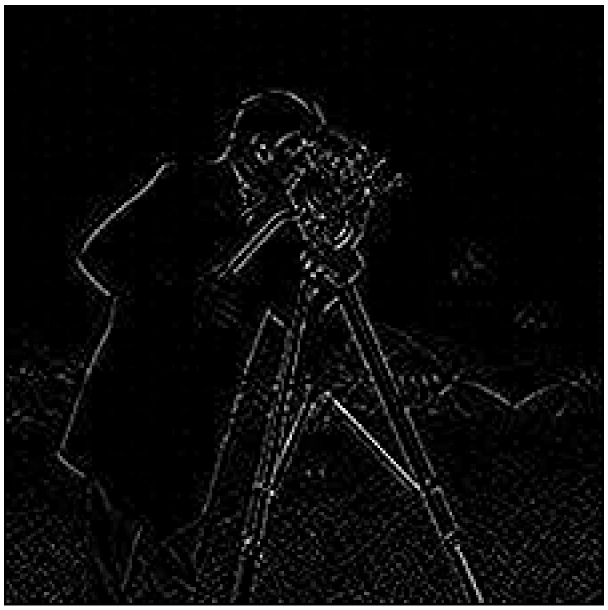
0.7 Q4

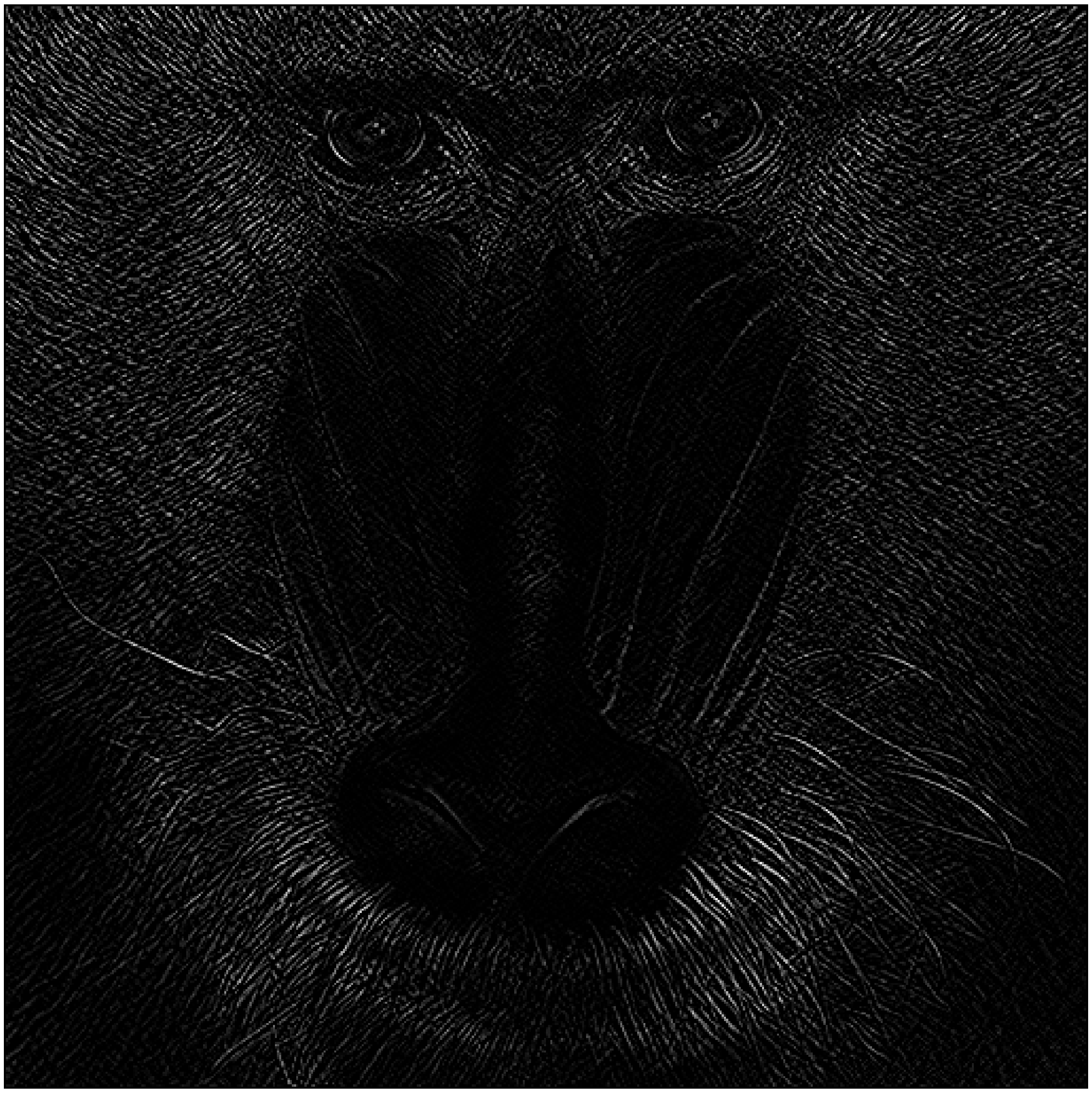
Sobel edge detection

[36]:
```python
# Calculating sobel gradients for each image :
sobelx1 = cv.Sobel(img1, cv.CV_64F, 1, 0, ksize=5)
sobely1 = cv.Sobel(img1, cv.CV_64F, 0, 1, ksize=5)
sobelxy1 = cv.Sobel(img1, cv.CV_64F, 1, 1, 5)
gradient = np.sqrt(sobelx1 ** 2 + sobely1 ** 2).astype(np.uint8)

sobelx2 = cv.Sobel(img2, cv.CV_64F, 1, 0, ksize=5)
sobely2 = cv.Sobel(img2, cv.CV_64F, 0, 1, ksize=5)
sobelxy2 = cv.Sobel(img2, cv.CV_64F, 1, 1, 5)
```

```
gradient = np.sqrt(sobelx2 ** 2 + sobely2 ** 2).astype(np.uint8)

sobelx3 = cv.Sobel(img3, cv.CV_64F, 1, 0, ksize=5)
sobely3 = cv.Sobel(img3, cv.CV_64F, 0, 1, ksize=5)
sobelxy3 = cv.Sobel(img3, cv.CV_64F, 1, 1, 5)
gradient = np.sqrt(sobelx3 ** 2 + sobely3 ** 2).astype(np.uint8)

sobelx4 = cv.Sobel(img4, cv.CV_64F, 1, 0, ksize=5)
sobely4 = cv.Sobel(img4, cv.CV_64F, 0, 1, ksize=5)
sobelxy4 = cv.Sobel(img4, cv.CV_64F, 1, 1, 5)
gradient = np.sqrt(sobelx4 ** 2 + sobely4 ** 2).astype(np.uint8)

# Edge detection using sobel filter :-
cv2_imshow(sobelxy1)
cv2_imshow(sobelxy2)
cv2_imshow(sobelxy3)
cv2_imshow(sobelxy4)
```







```
[ ]:
```