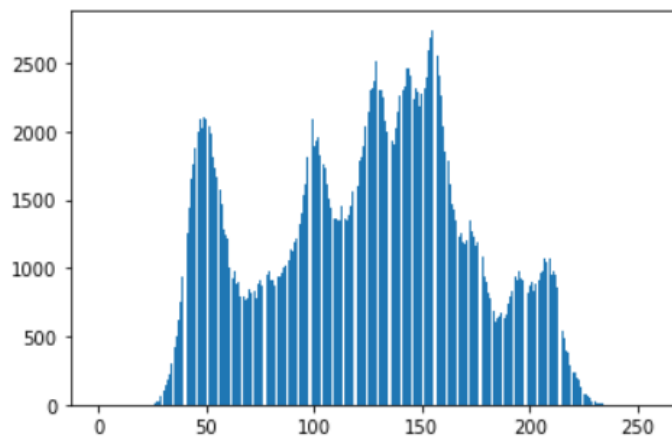


Computer Vision HW3

1.

先在 for 迴圈裡一一統計就可

```
1 import cv2
2 import matplotlib.pyplot as plt
3 import numpy as np
4
5 lena = cv2.imread('C:/Users/kaiyuchou/test_data/lena.bmp', cv2.IMREAD_GRAYSCALE)
6
7 x = lena.shape[0] #寬尺寸
8 y = lena.shape[1] #長尺寸
9
10 histogram = np.zeros(256, int)
11
12 for i in range(0, x, 1):
13     for j in range(0, y, 1):
14         histogram[lena[i][j]] += 1
15
16 cv2.imwrite('histogram.jpg', histogram)
17 plt.bar(range(len(histogram)), histogram)
18 plt.show()
```



2.

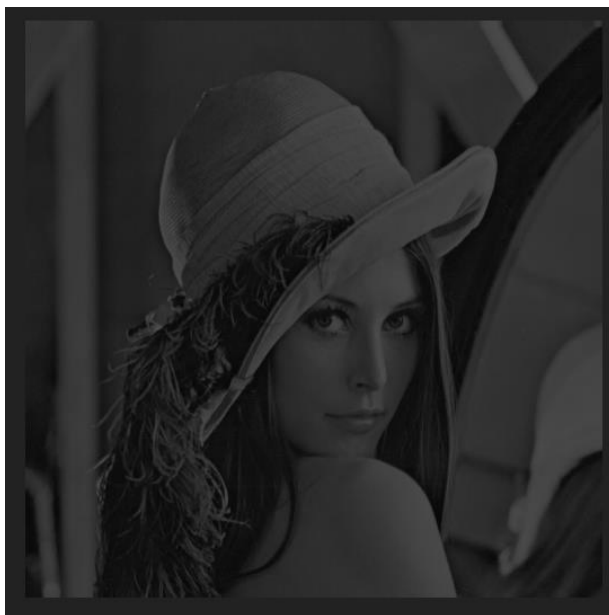
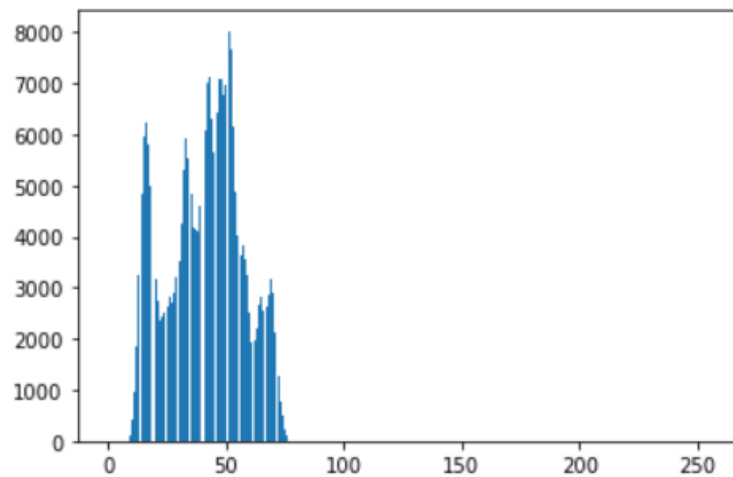
```
for i in range(0, x, 1):
    for j in range(0, y, 1):
        a = lena[i][j]
        b = a/3
        lena_divide[i][j] = b

cv2.imwrite('lena_divide.bmp', lena_divide)
#plt.imshow(lena_divide, cmap = 'gray')

histogram = np.zeros(256, int)

for i in range(0, x, 1):
    for j in range(0, y, 1):
        divide_histogram[lena_divide[i][j]] += 1
```

一樣就是每一個 pixel 去除以 3 再放到新的空的即可，接著在統計



3.

```
lena_equa = np.zeros(lena.shape, int)
equa_histogram = np.zeros(256, int)
lena_equa_list = np.zeros(256, int)

for i in range(0, 256, 1):
    lena_equa_list[i] = 255 * np.sum(divide_histogram[0 : i + 1]) / (x * y)
    #print(lena_equa_list)

for i in range(0, x, 1):
    for j in range(0, y, 1):
        a = lena_divide[i][j]
        lena_equa[i][j] = lena_equa_list[a]

cv2.imwrite('lena_equa.bmp', lena_equa)
#plt.imshow(lena_equa, cmap = 'gray')

for i in range(0, x, 1):
    for j in range(0, y, 1):
        equa_histogram[lena_equa[i][j]] += 1
```

取上一次的一樣每一個 pixel 的機率在用累積的機率之後就可以
除以總數在取整數部分就可以完成每一個 pixel 的 equalization

