COMPUTER VISION HW3 REPORT

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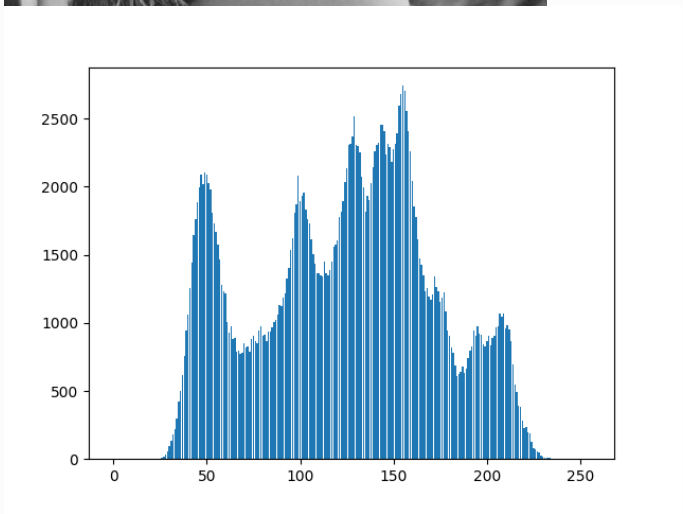
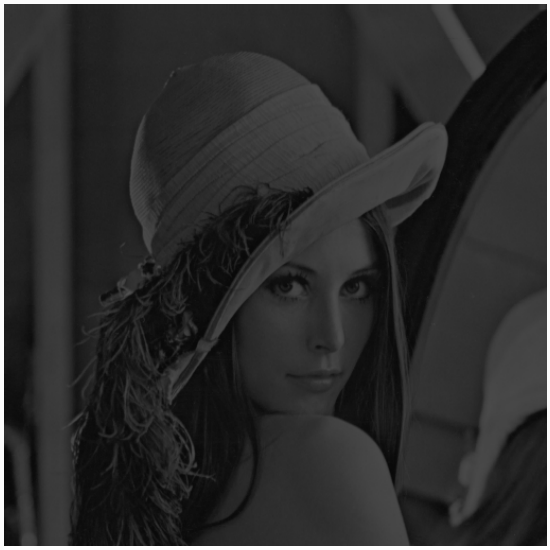
(a)

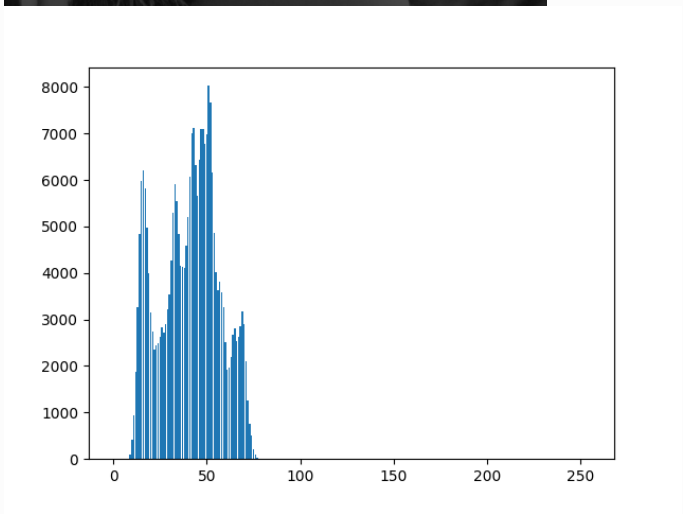
```
r, c = im.size

x = np.arange(256)
y = np.zeros(256, dtype = np.int32)

for i in range(r):
  for j in range(c):
    value = im.getpixel((i,j))
    y[value] += 1

plt.bar(x,y)
plt.savefig("histogram.png", format = "png")
```



(b)

與(a)方法相同，只是將lana.bmp得到pixel value 數值除以3。





(c)

將(b)的圖片讀入**img**，並製作出大小為256的統計陣列 **histogram**。用投影片的 pseudocode

Step 1

- histogram equalization histogram linearization

$$s_k = 255 \sum_{j=0}^{k} \frac{n_j}{n}$$

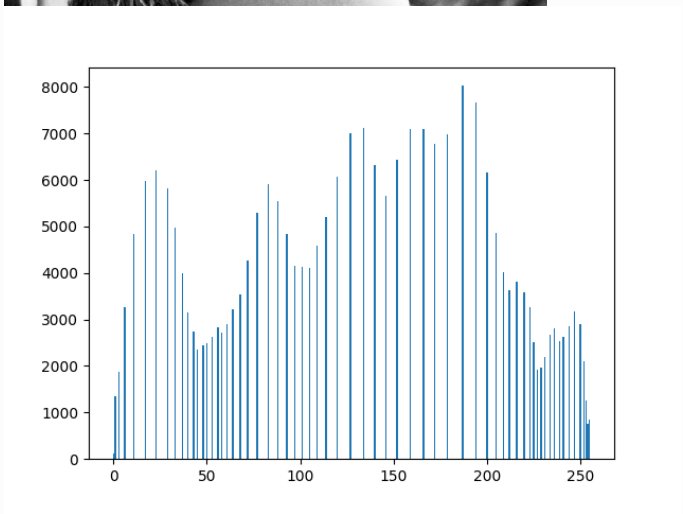
- $k = 0,1, \ldots, 255$, n_j: number of pixels with intensity j
- n : total number of pixels

```
total_pixel = r * c

for i in range(1,256):
  s[i] = s[i-1] + histogram[i]

for i in range(256):
  s[i] = round((s[i]*255) / total_pixel)
  histogram[i] = 0
```

Step 2

- for every pixel if $I(im, i, j) = k$ then $I(imhe, i, j) = s_k$

```
for i in  range(r):
  for j in range(c):
    img[i][j] = s[img[i][j]]
    histogram[img[i][j]] += 1
```


8000
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250