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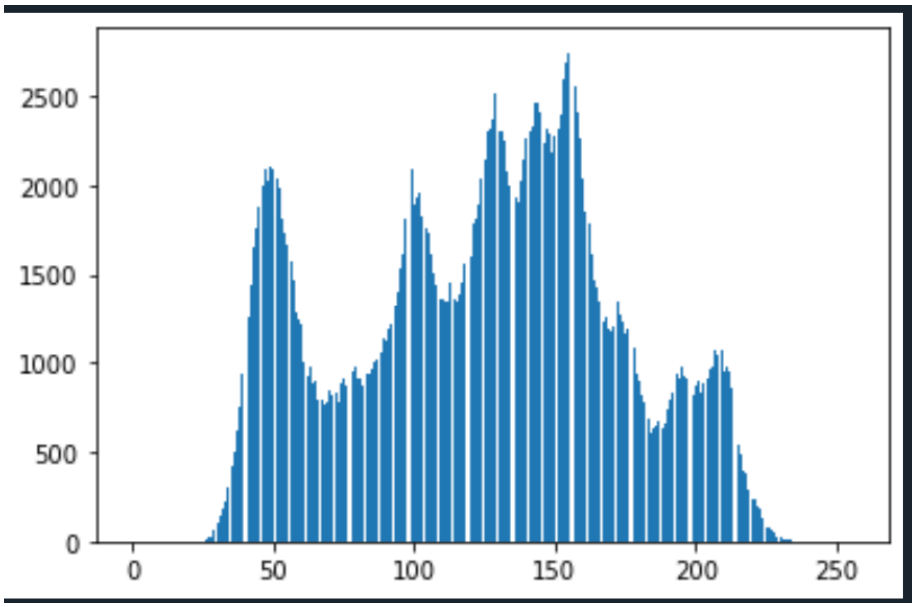
Binarize

將 lena.bmp 用灰階讀進來後，對每一個位置檢查其值，若大於等於 128 就設成 255，反之則將小於 128 的設為 0。

Histogram

將 lena.bmp 讀進來後，用上面的 binarize 轉成灰階，檢查每一格 pixel 的值，每檢查到一個值就將它加一到對應的位置去(一個起始值為 0 的 xaxies[256]的 array 中)，最後將 array 中的值用 matplotlib(plt.bar)畫成一個圖表。



```
import numpy as np
import matplotlib.pyplot as plt
import cv2

def img_binarize(img_in ):
    #(a)a binary image (threshold at 128)
    shape = img_in.shape
    binimg = np.zeros(shape )
    for i in range(shape[0]):
        for j in range(shape[1]):
            for k in range(2):
                if img_in[i][j][k] >= 128:
                    binimg[i][j] =255
                else:
                    binimg[i][j] = 0
    return binimg

def img_histogram(img_in):
    # (b) a histogram
    xaxies = np.zeros(256    ,dtype = int)
    shape = img_in.shape
    for i in range(shape[0]):
        for j in range(shape[1]):
            xaxies[img_in[i][j]] +=1

    return xaxies



colorimg = cv2.imread('lena.bmp')
shape = colorimg.shape

binimg = img_binarize(colorimg )
cv2.imshow('bin ', binimg)

hist = img_histogram(colorimg)
plt.bar(range(0, 256), hist)
plt.savefig('histogram.png')
```

```
plt.show()

cv2.waitKey(0)
cv2.destroyAllWindows()
```