HW3 Report

環境: python3, pillow, matplotlib

檔案:

------equalized.bmp

------histogram.jpg

------lena.bmp

------report.pdf

------hw3.py

執行:　python3 hw3.py　　(make sure there's the image file "lena.bmp")

作法:

先計算出原本的 histogram，接下來代公式算出各自對應的新 value。

這裡是先算 sk[i]也就是 value <= i 的 pixel 總數，最後要放回圖片的新值是 sk[i] * 255 / 總 pixel 數

```
#get histogram
for i in range(width):
    for j in range(height): count[im.getpixel((i, j))] += 1
#prepare sk
sk += [count[0]]
for i in range(1, 256): sk += [sk[i-1] + count[i]]
#modify image
for i in range(width):
    for j in range(height):
        where = (i, j)
        im.putpixel(where, sk[im.getpixel(where)] * 255 // total)
```

儲存完新圖後最後再用 hw2 的程式把新圖的 histogram 算出來並輸出

```
im.save("equalized.bmp")
im.close()

#draw histogram of new image
im = Image.open('equalized.bmp')
width, height = im.size

#caculate the histogram
xaxis, count = [i for i in range(256)], [0]*256
for i in range(width):
    for j in range(height):
        count[im.getpixel((i,j))] += 1
#draw
plt.bar(xaxis, count, color='blue')
plt.savefig('histogram.jpg')
im.close()
```