Computer Vision hw3

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- Write a program to do histogram equalization

```
####divide by 3####
for i in range(int(im.size[0])) :
    for j in range(int(im.size[1])) :
        im_div3.putpixel((i,j), pixels[i,j]//3)
        pixel_array.append(pixels[i,j]//3)
```

先將 lena.bmp 中的每個 pixel 直接除以 3，小數部分直接捨去

```
####calculate pixel numbers###
ctr = [0]*86
for i in range(len(pixel_array)) :
    ctr[pixel_array[i]] += 1
pixel_num = [ctr[0]]

```

再對每個 pixel 的頻率做統計，準備 histogram equalization 用

```
div_pixel = im_div3.load()
div_new_pixel = []

####histogram equalization####
for i in range(int(im.size[0])) :
    for j in range(int(im.size[1])) :
        im_con.putpixel((i,j), (255*pixel_num[div_pixel[i,j]]//pixel_num[85]))
        div_new_pixel.append(255*pixel_num[div_pixel[i,j]]//pixel_num[85])

im_con.save('lena_con.bmp')
```

histogram equalization 部分，將 pixel 根據比例(PR 值)放大

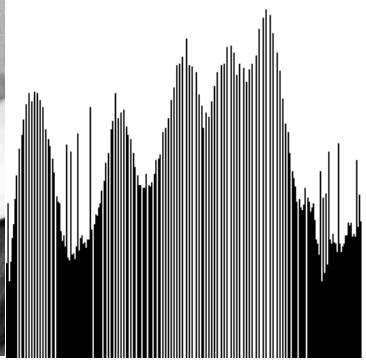
```
####create histogram####
im_hist = Image.new('L', (256,256), 'white')

div_pixel_array = [0]*256
for i in range(int(im.size[0])) :
    for j in range(int(im.size[1])) :
        div_pixel_array[div_new_pixel[i*im.size[0]+j]] += 1

M = max(div_pixel_array)
for i in range(256) :
    div_pixel_array[i] = div_pixel_array[i]*(250)//M

for i in range(256) :
    for j in range(256-div_pixel_array[i],256,1) :
        im_hist.putpixel((i,j), 0 )

im_hist.save('hist.bmp')
```

將 result 的圖檔做成長條圖統計

Result :

- Original

- Only histogram equalization



- Divide by 3 and histogram equalization