Computer vision homework 3

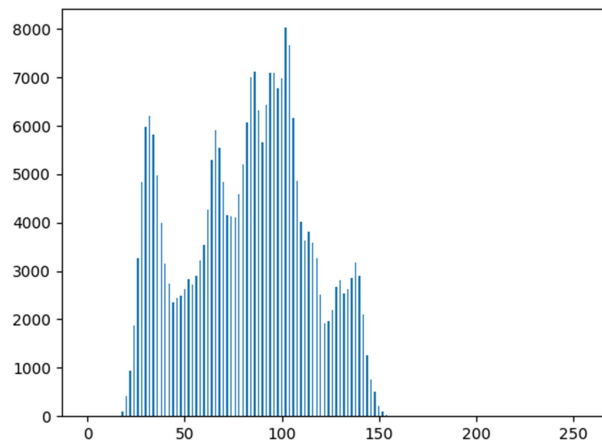B04902028 資工三 洪浩翔

1. Histogram Equalization:

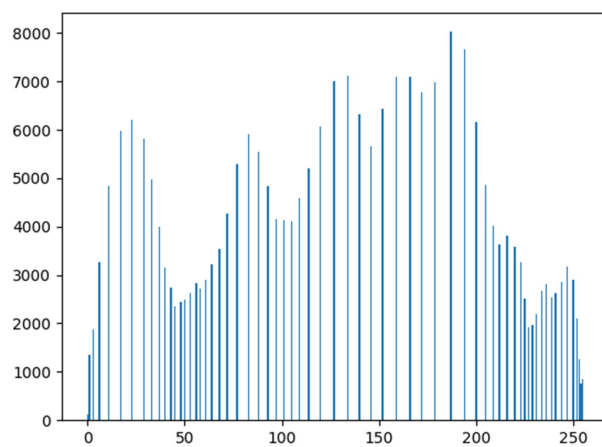This is dark image we want to use Histogram Equalization

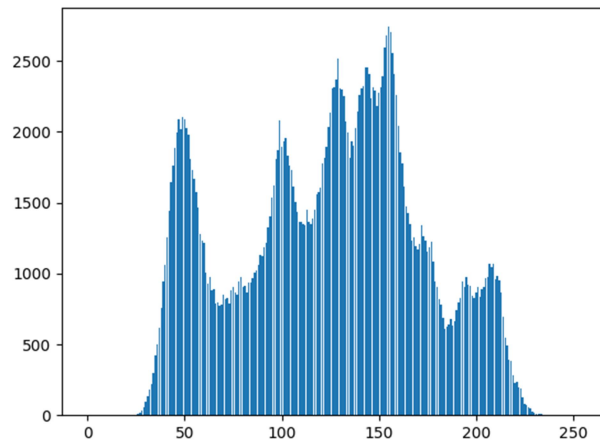This is the image after Histogram Equalization

This is original lena image

This is histogram of original dark image

This is histogram after Histogram Equalization

This is histogram of original lena image

Main code:

```python
histo = [0]*256
histo2 = [0]*256
histo3 = [0]*256

cdf = [0 for i in range(256)]


image = Image.open('lena.bmp')
dark_image = image.copy()
result = dark_image.copy()

(h , w) = image.size

for i in range(h):
  for j in range(w):
    dark_image.putpixel((i , j) , (image.getpixel((i , j)) / 3) * 2)
    histo[image.getpixel((i , j))] += 1
    histo2[dark_image.getpixel((i , j))] += 1


tmp = 0
min_num = 0
for i in range(256):
  tmp += histo2[i]
  cdf[i] = tmp
for i in range(256):
  if cdf[i] != 0:
    min_num = i
    break
```

This part is dealing data structure and cdf counting with finding the min cdf

```python
for i in range(w):
    for j in range(h):
        hv = round( (float(cdf[dark_image.getpixel((i , j))] - cdf[min_num]) / float((h*w)-cdf[min_num])) * (255.0) )
        result.putpixel((i , j) , int(hv))
        histo3[result.getpixel((i , j))] += 1

dark_image.show()
dark_image.save('C:\Users\user\Documents\computer_vision\dark_image.bmp')

result.show()
result.save('C:\Users\user\Documents\computer_vision\hito_equal.bmp')


plt.bar(range(0 , 256) , histo)
plt.show()
plt.bar(range(0 , 256) , histo2)
plt.show()
plt.bar(range(0 , 256) , histo3)
plt.show()
```

This part is dealing with Histogram Equalization and plot