Computer Vision Hw #3

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Homework Description

- (a) original image and its histogram
- (b) image with intensity divided by 3 and its histogram
- (c) image after applying histogram equalization to (b) and its histogram

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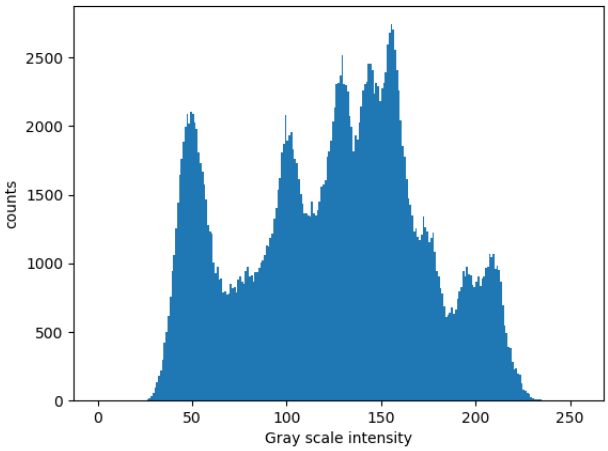
- **Histogram**

Use : matplotlib

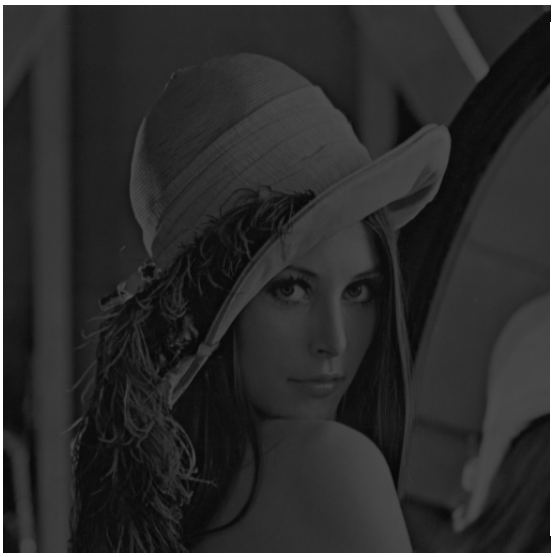
```
cnt = []
for i in range(length):
    for j in range(length):
        cnt.append(arr[i][j])
plt.hist(np.array(cnt), bins=range(256))
```

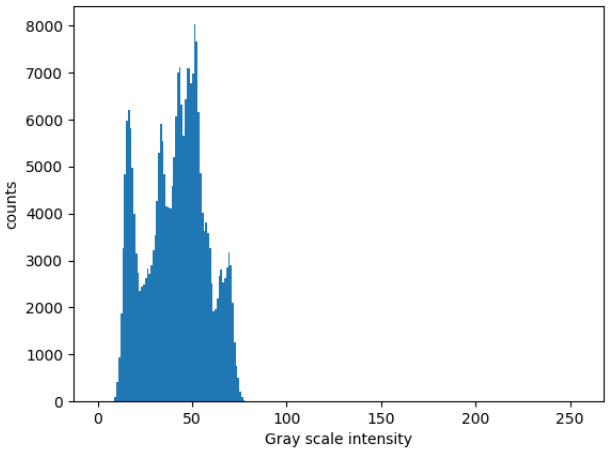


- Histogram with intensity divided by 3**

Simply change the value of array

```
cnt = []
for i in range(length):
    for j in range(length):
        arr[i][j] = arr[i][j] // 3
        cnt.append(arr[i][j])
plt.hist(np.array(cnt), bins=range(256))
```





- **Image after applying histogram equalization to (b) and its histogram**

Apply the equalization on the image from (b)

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

```
"""get the image from (b)"""
for i in range(length):
    for j in range(length):
        arr[i][j] = arr[i][j] // 3

"""do accumulation"""
cnt = np.zeros(256)
tot = 0
for i in range(length):
    for j in range(length):
        cnt[arr[i][j]] += 1
        tot += 1
```

```
"""create mapping"""
mp = np.zeros(256)
acc = 0
for i in range(256):
    acc += cnt[i]
    mp[i] = int(255 * (acc / tot))
cnt = []
"""Finally the image"""
for i in range(length):
    for j in range(length):
        arr[i][j] = mp[arr[i][j]]
        cnt.append(arr[i][j])

plt.hist(np.array(cnt), bins=range(256))
```