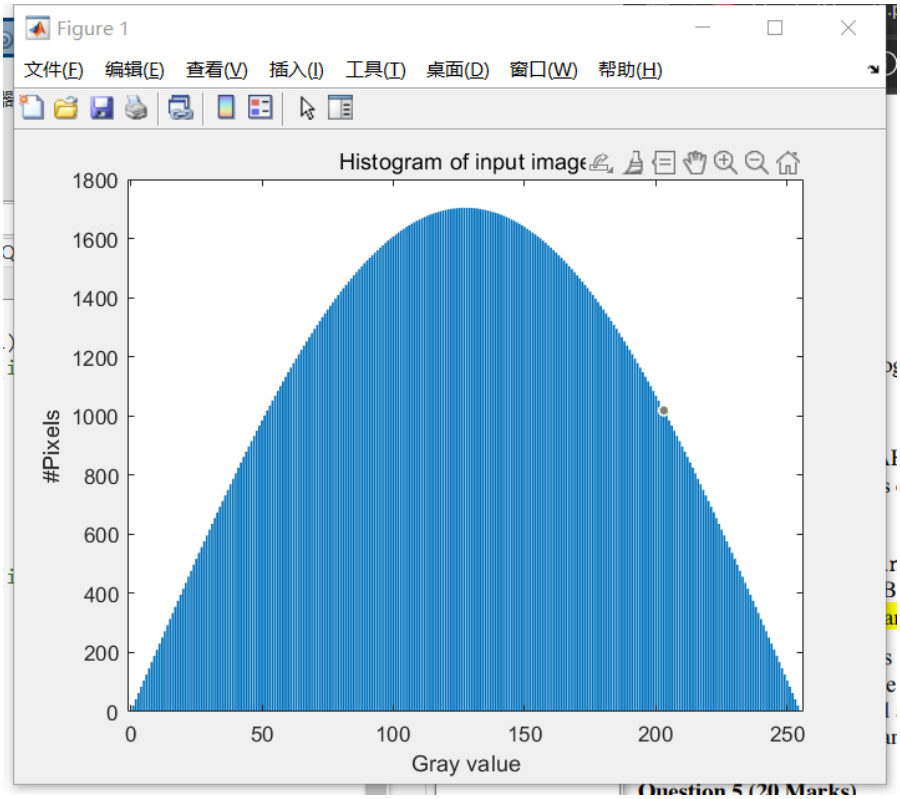
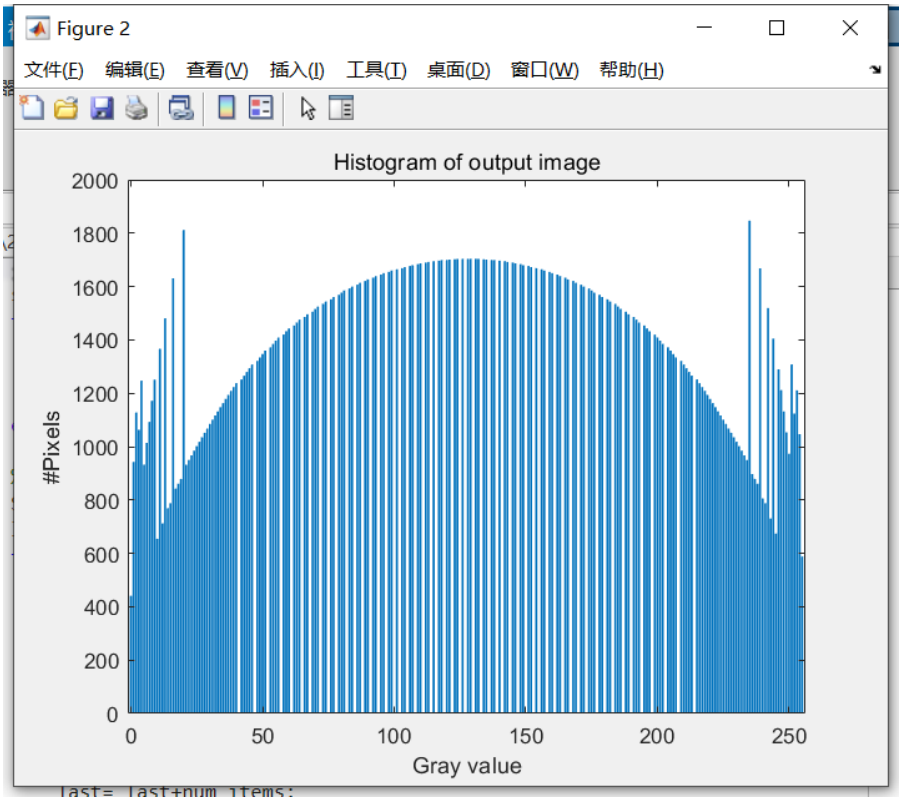
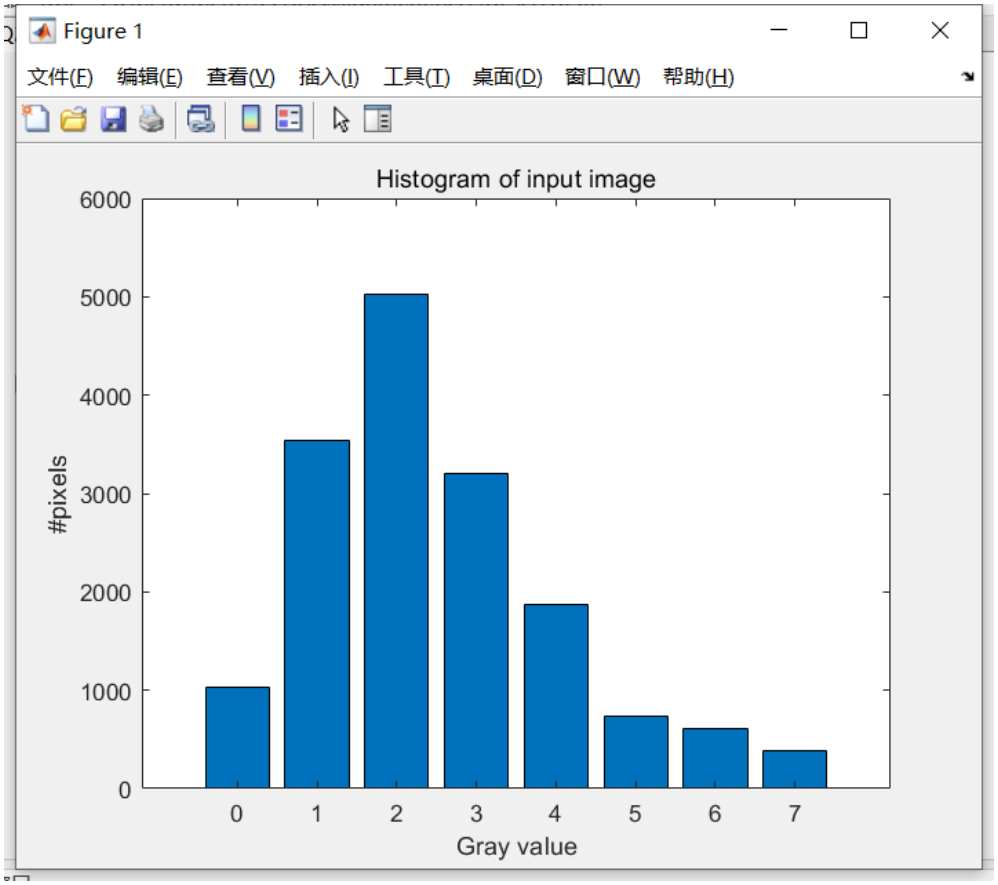
Note: All my work, I implemented by MATLAB, and I pushed them to my private repository on Github, and A1 under this repository to do version control. If there is any issue of assignment, I can give marker access to check my versions.

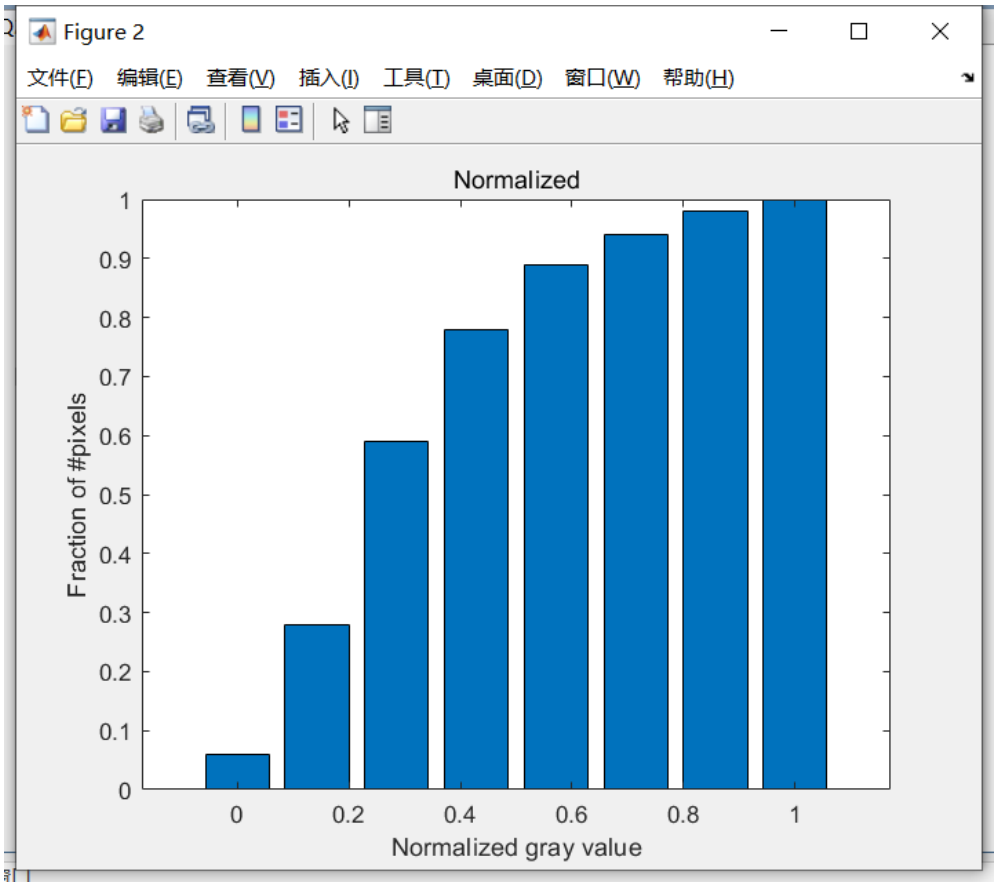
Q1. Implemented this by MATLAB code.





Q2. Histograms of input image, normalized image and output image are shown below.





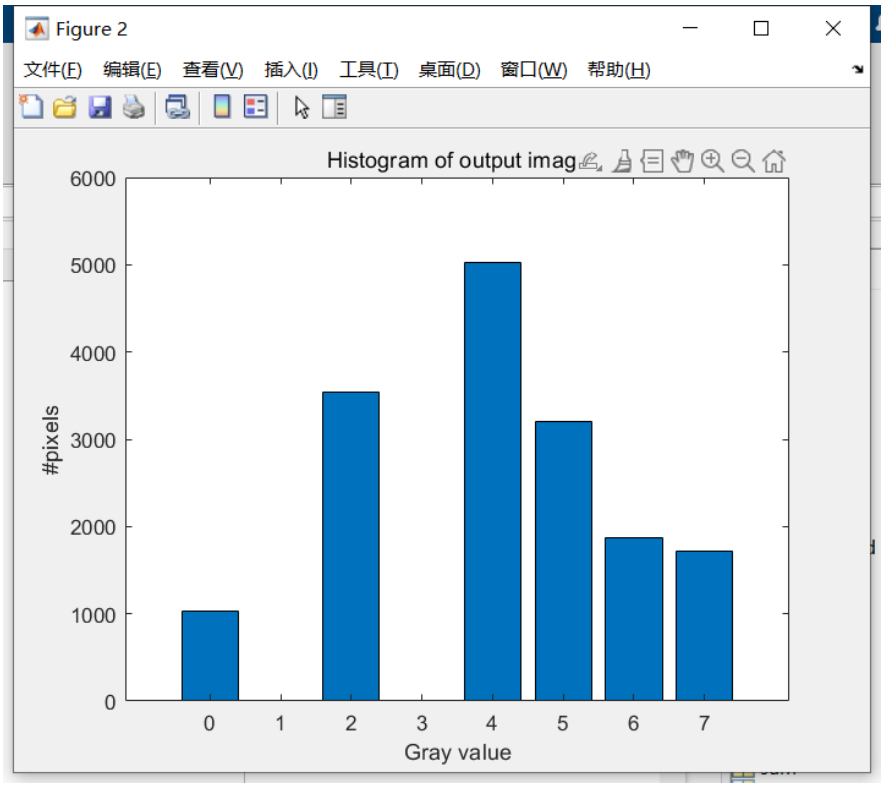
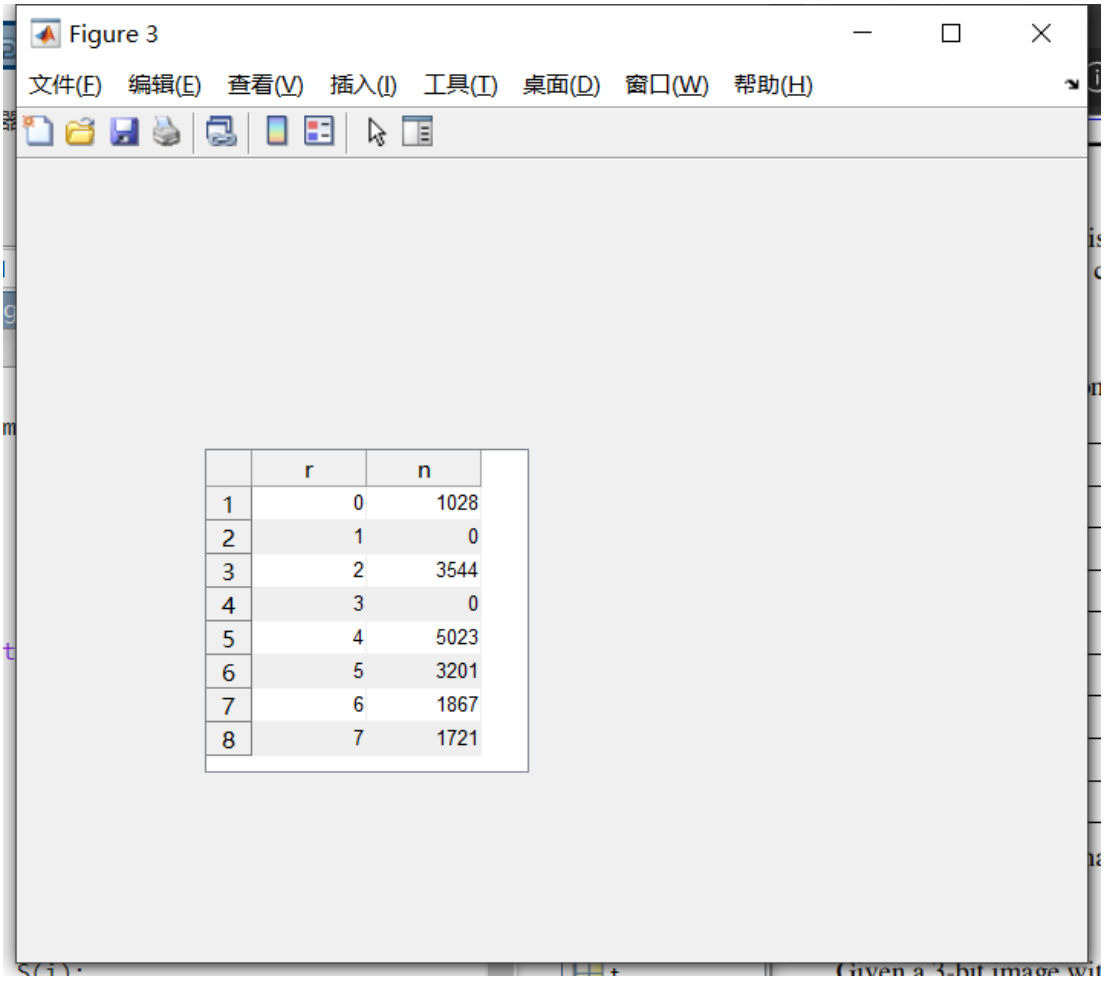
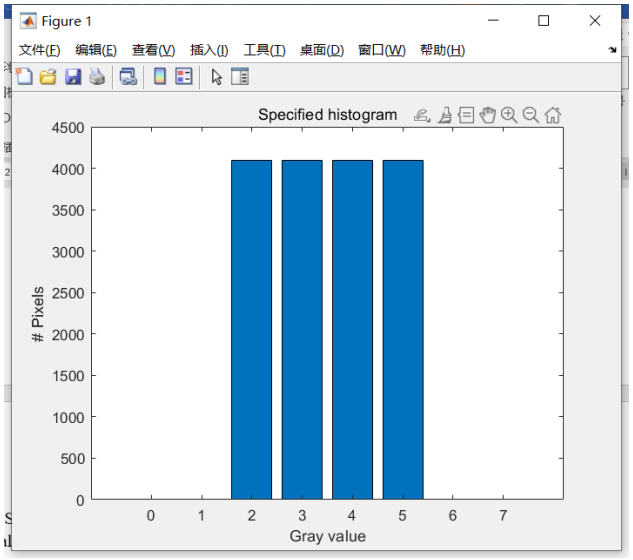


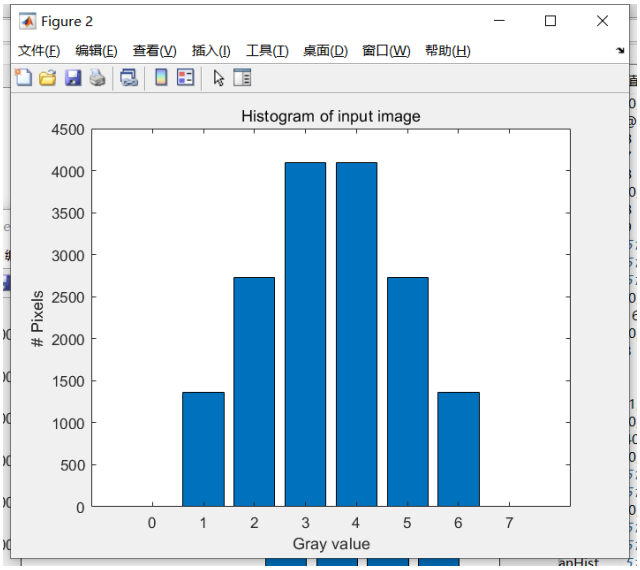
Table of output image

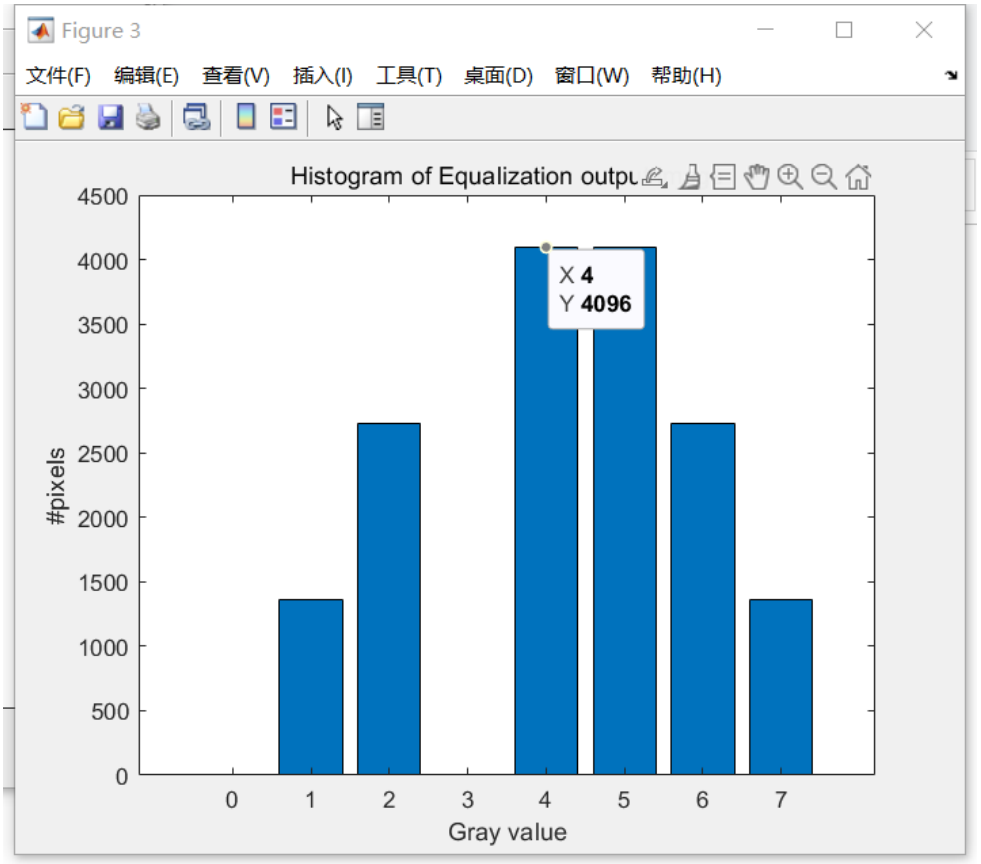


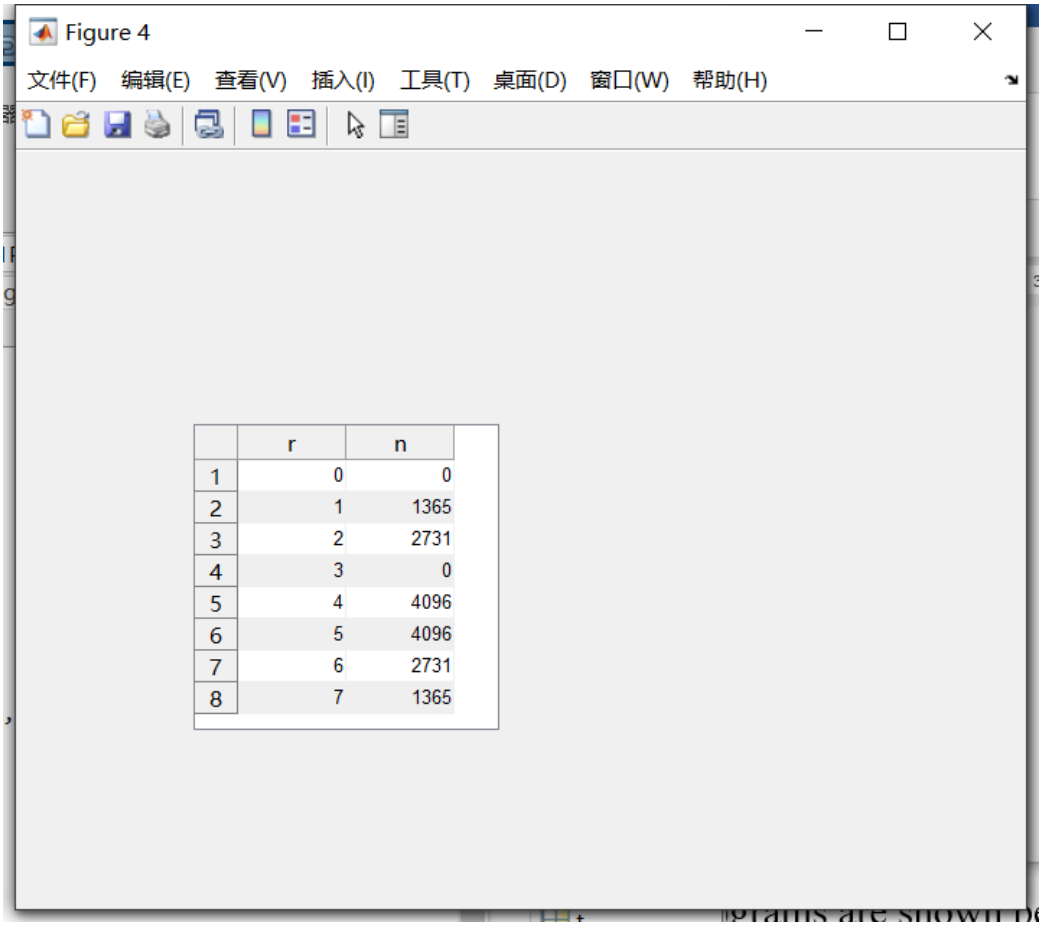
	r	n
1	0	1028
2	1	0
3	2	3544
4	3	0
5	4	5023
6	5	3201
7	6	1867
8	7	1721

Q3. Specified histogram, Histogram of input image and Histogram of output image by equalization as shown below. However, I didn't figure out how to do specification by MATLAB. I tried my best to implement.



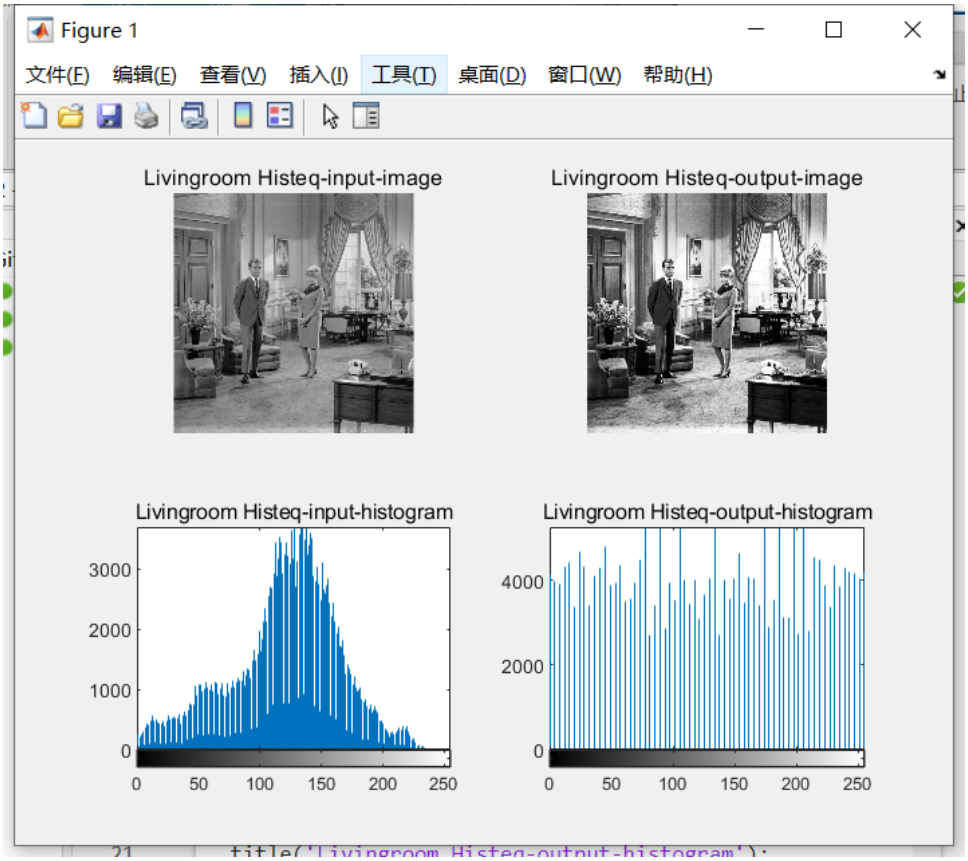


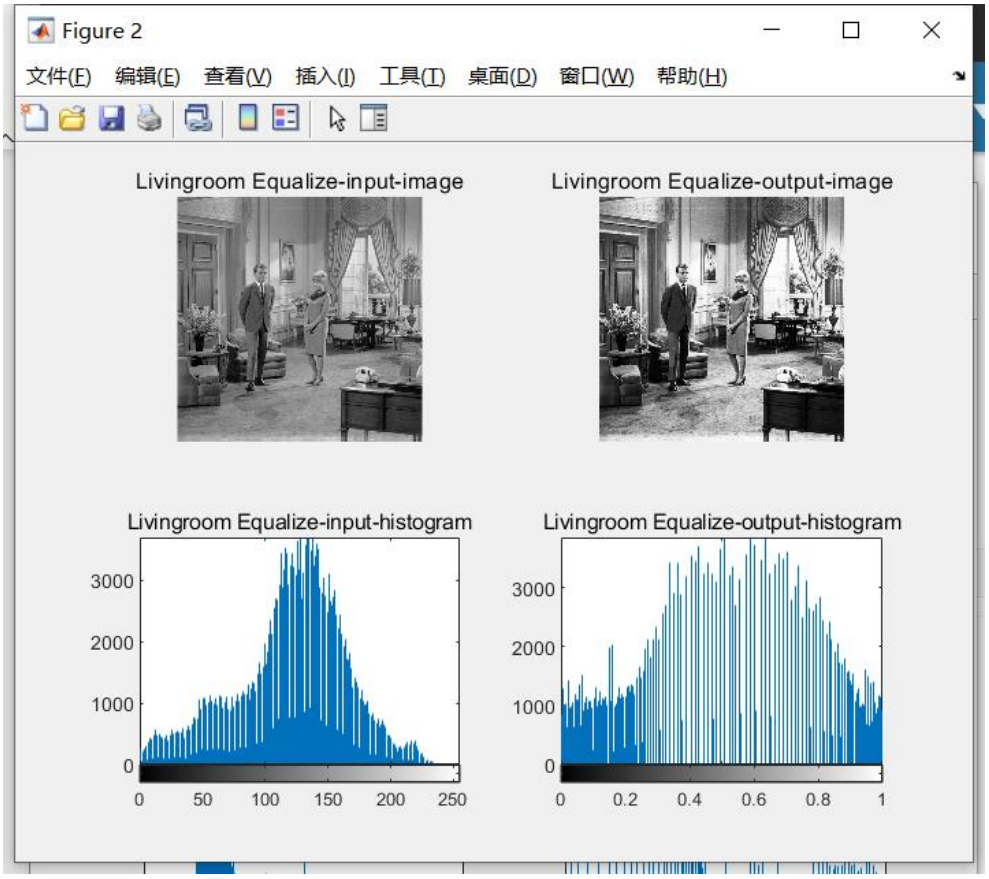




	r	n
1	0	0
2	1	1365
3	2	2731
4	3	0
5	4	4096
6	5	4096
7	6	2731
8	7	1365

Q4. Livingroom and woman_darkhair images and histograms are shown below. I have no clue histograms are different by two functions.





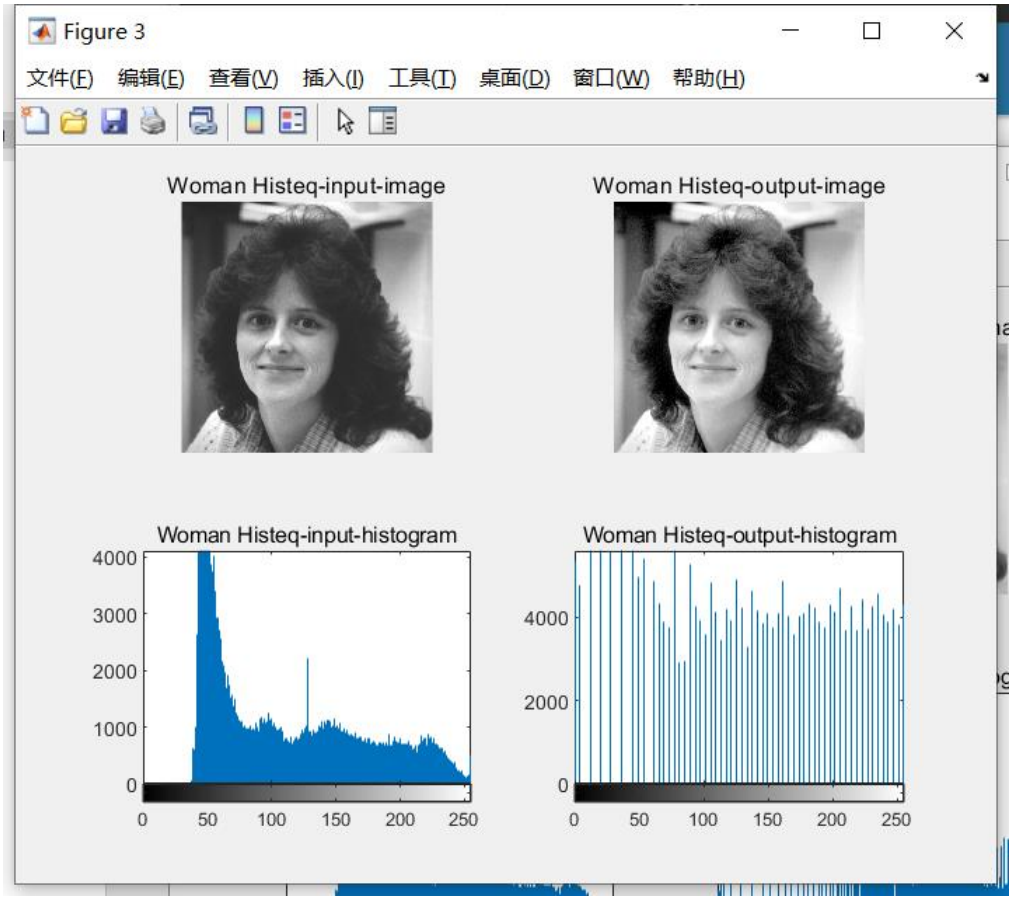


Figure 3
文件(F) 编辑(E) 查看(V) 插入(I) 工具(T) 桌面(D) 窗口(W) 帮助(H)
Woman Histeq-input-image
Woman Histeq-output-image
Woman Histeq-input-histogram
Woman Histeq-output-histogram
4000
3000
2000
1000
0
0 50 100 150 200 250

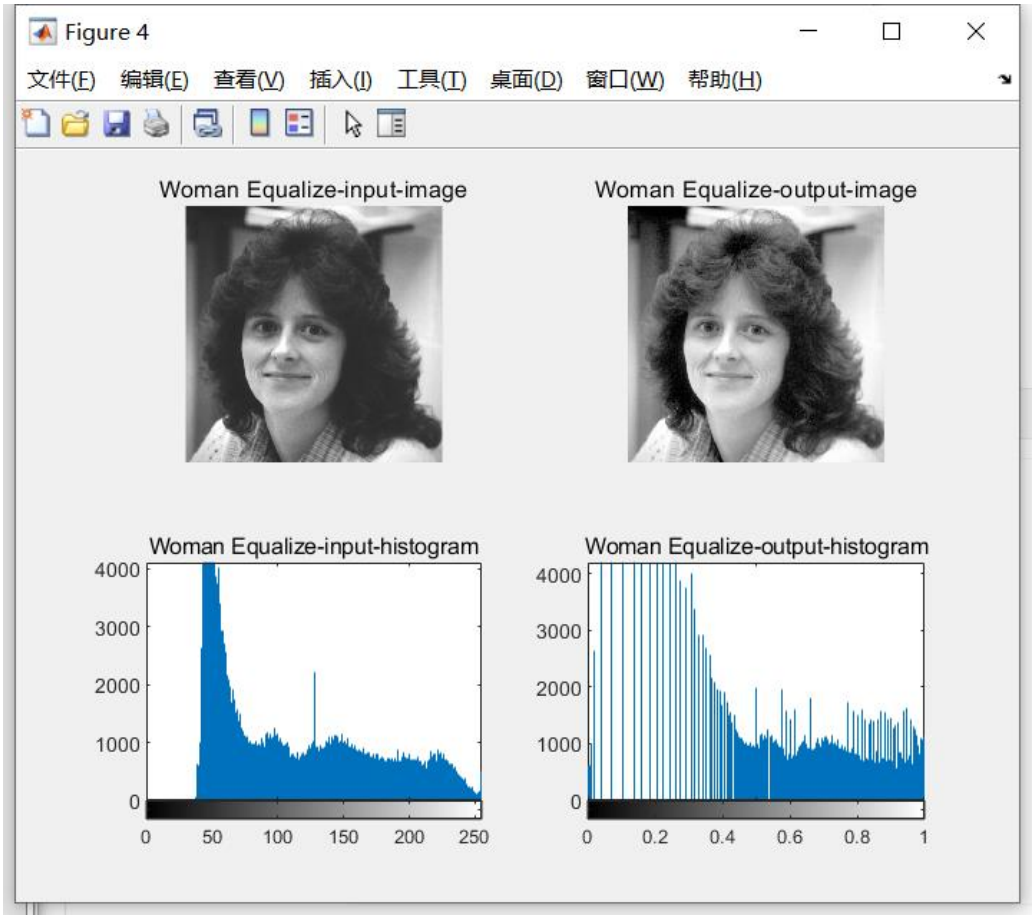
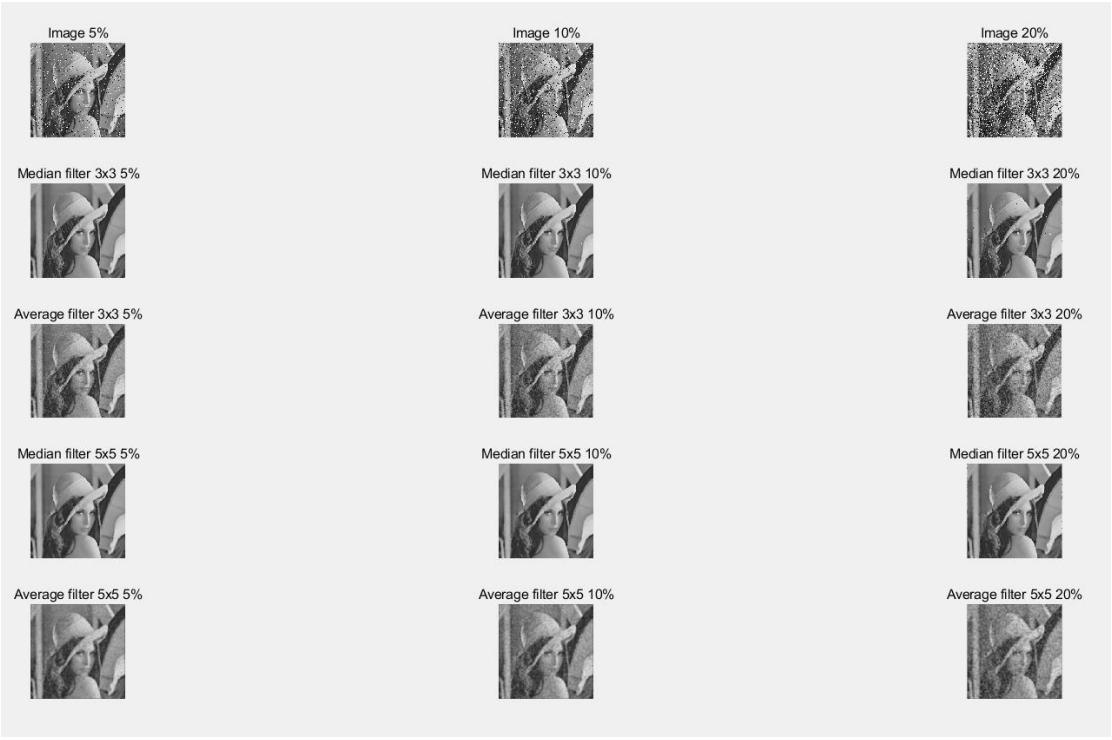


Figure 4
文件(F) 编辑(E) 查看(V) 插入(I) 工具(T) 桌面(D) 窗口(W) 帮助(H)
Woman Equalize-input-image
Woman Equalize-output-image
Woman Equalize-input-histogram
Woman Equalize-output-histogram
4000
3000
2000
1000
0
0 50 100 150 200 250
0 0.2 0.4 0.6 0.8 1

Q5. Comparison of 15 images in one figure, then I extracted and compared them in 3 groups by different densities. Based on the results of 3 groups, Median filter can filte more noise than average filter. 5 * 5 can filte more than 3 * 3, I think it is because the filter is smoother, by levels are changing. The changing is not sharp as 3*3. Thirdly, in the same filter with the same size the ability of filter noise is different, higher densities, less noise can be filtered.



5 %

Image 5%

Median filter 3x3 5%

Average filter 3x3 5%

Median filter 5x5 5%

Average filter 5x5 5%

10%

Image 10%

Median filter 3x3 10%

Average filter 3x3 10%

Median filter 5x5 10%

Average filter 5x5 10%

20 %

Image 20%

Median filter 3x3 20%

Average filter 3x3 20%

Median filter 5x5 20%

Average filter 5x5 20%