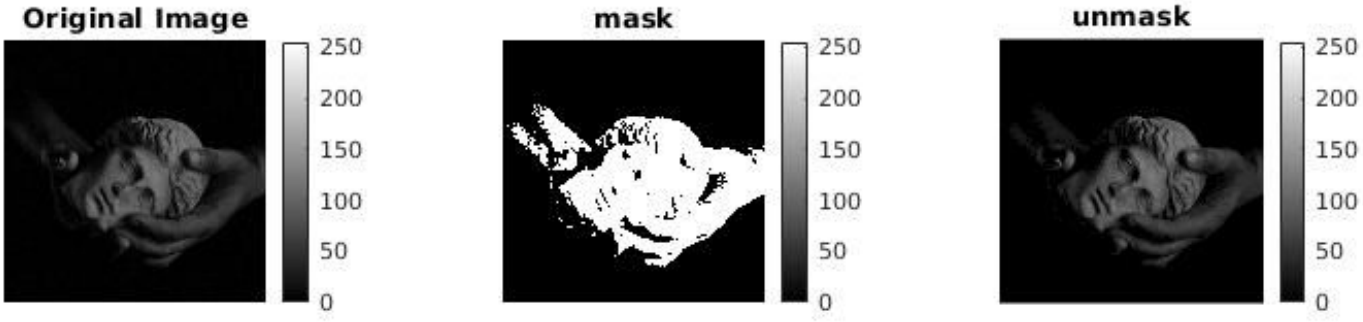
Q2)

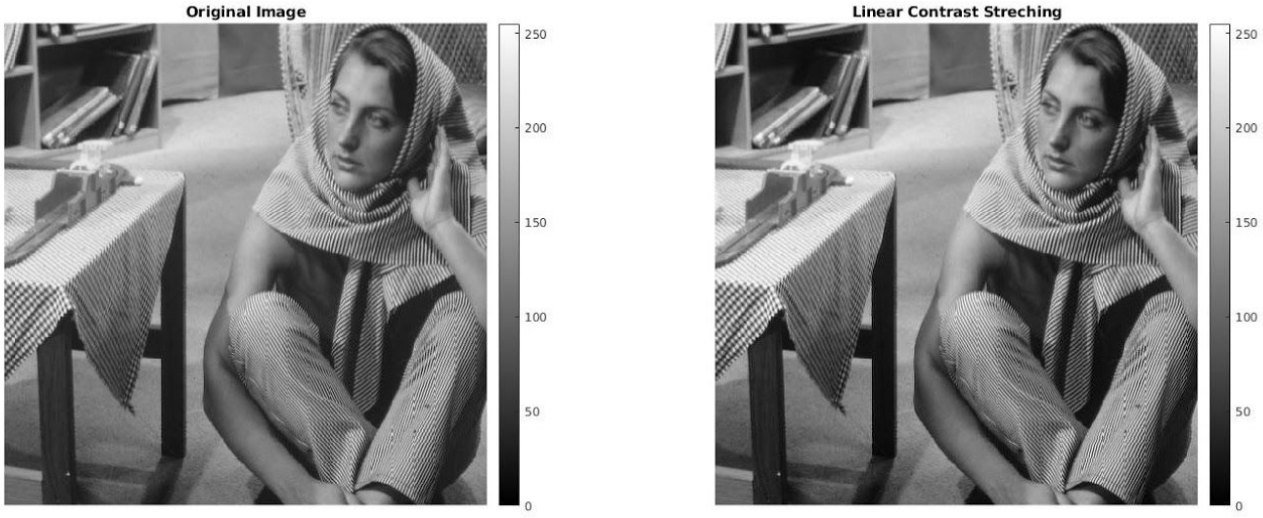
a)

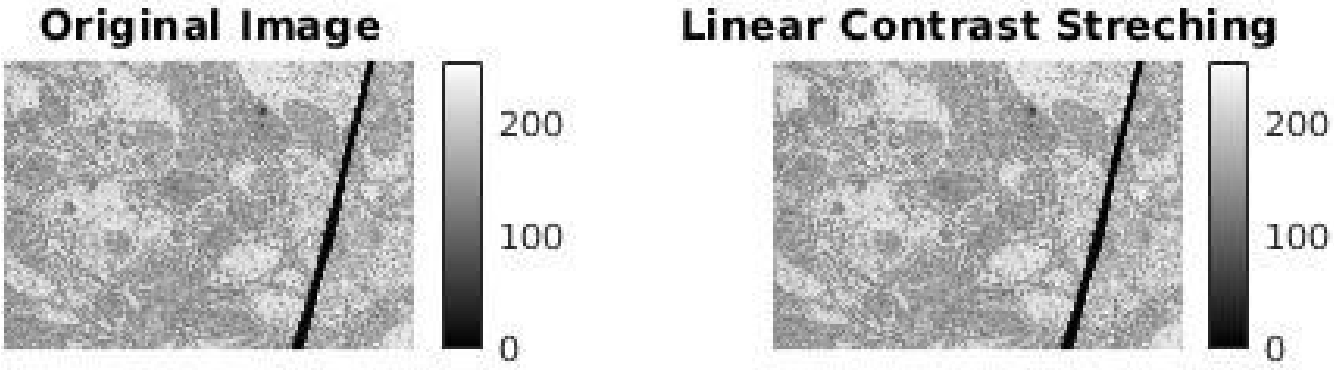


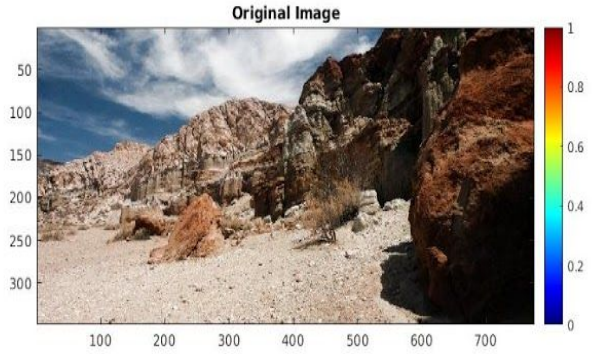
b)

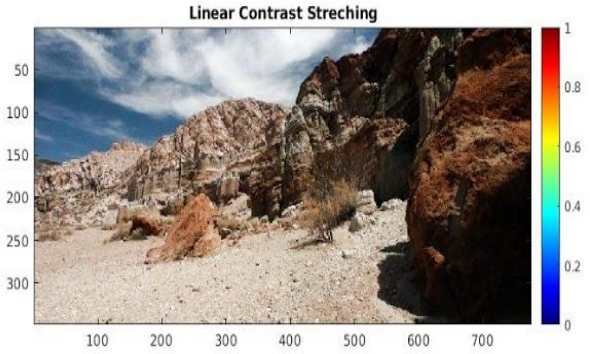
Formula:- I_{new}(new intensity) = 255*(I_{old} - c)/(d - c)

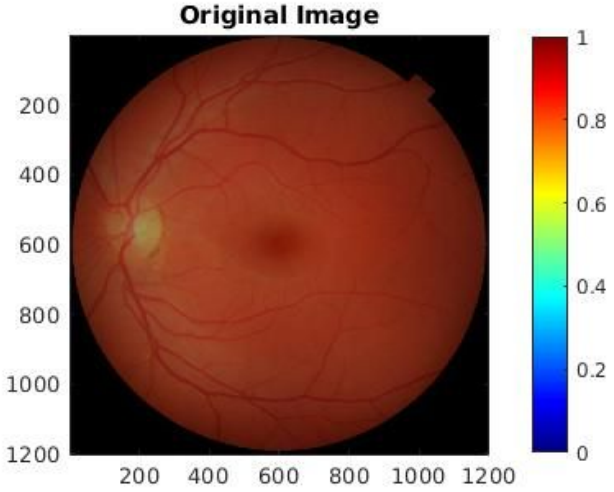
Where c,d = lowest and highest pixel values

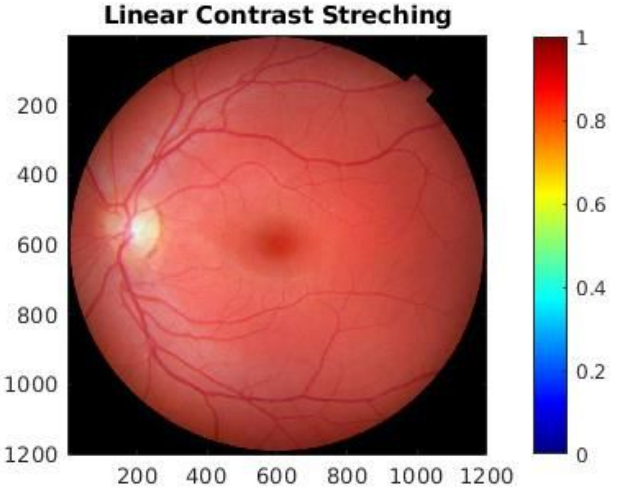


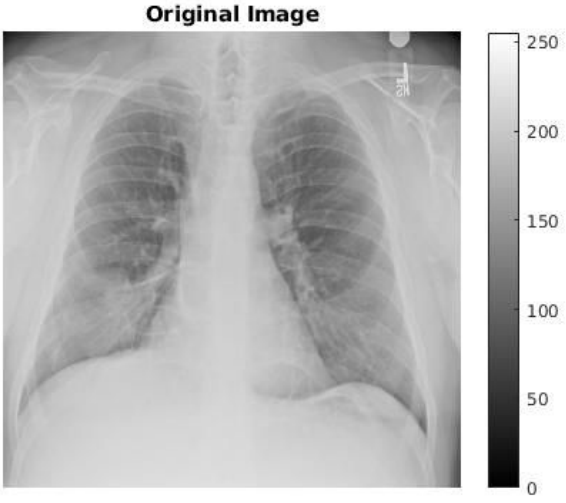


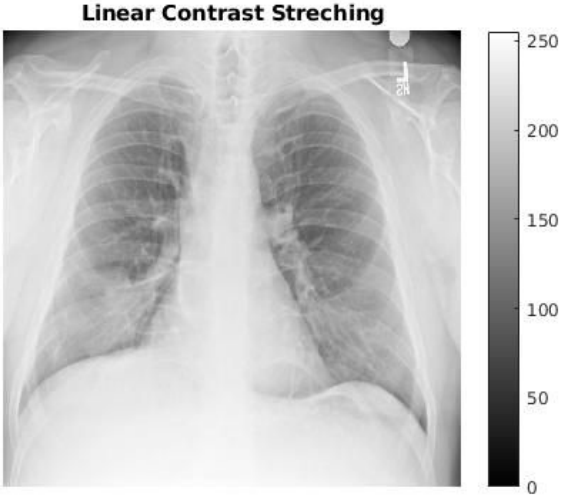

Original Image
50
100
150
200
250
300
100
200
300
400
500
600
700
1
0.8
0.6
0.4
0.2
0

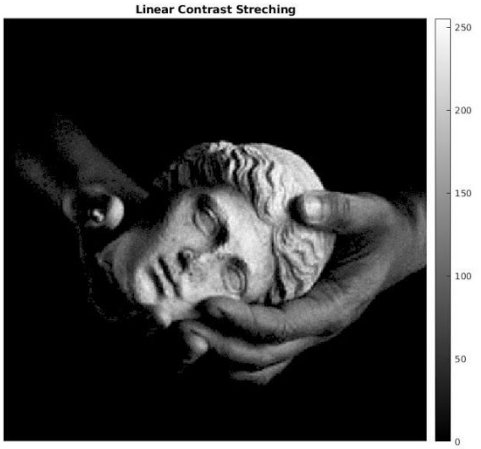

Linear Contrast Streching
50
100
150
200
250
300
100
200
300
400
500
600
700
1
0.8
0.6
0.4
0.2
0


Original Image
200
400
600
800
1000
1200
200
400
600
800
1000
1200
1
0.8
0.6
0.4
0.2
0


Linear Contrast Streching
200
400
600
800
1000
1200
200
400
600
800
1000
1200
1
0.8
0.6
0.4
0.2
0

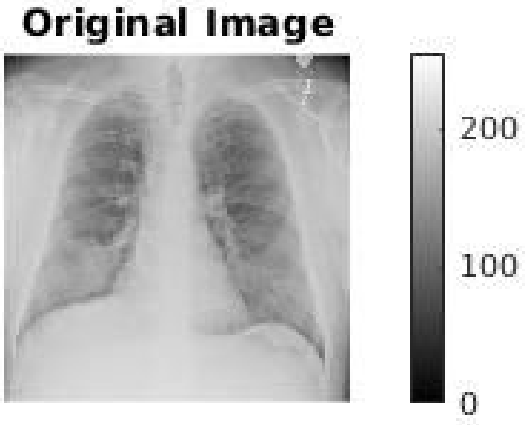

Original Image
250
200
150
100
50
0

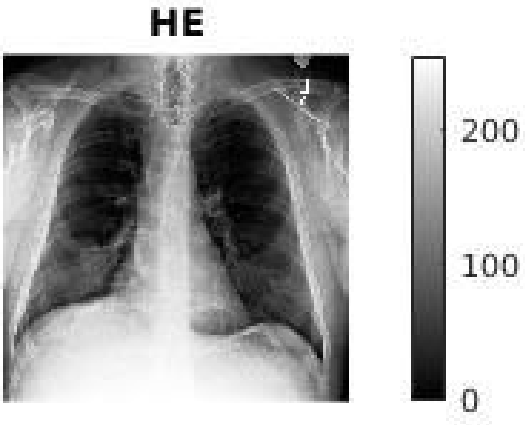

Linear Contrast Streching
250
200
150
100
50
0



The intensity distribution in 5 is from 0 to 255. Hence the output will not change after contrast stretching.

c)


Original Image
200
100
0

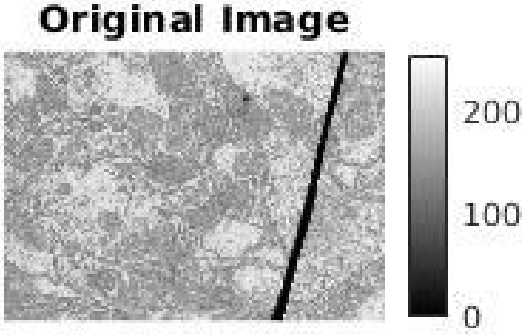

HE
200
100
0

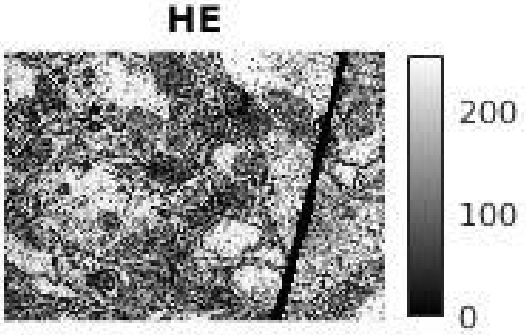

Original Image
200
400
600
800
1000
1200
500
1000
1500
1
0.5
0

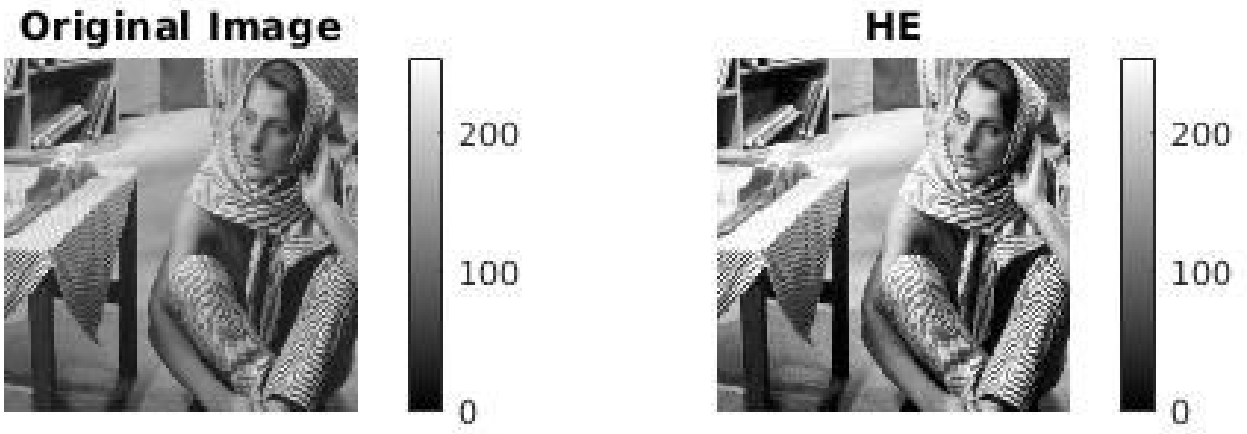

HE
200
400
600
800
1000
1200
500
1000
1500
1
0.5
0


Original Image
100
200
300
200
400
600
1
0.5
0

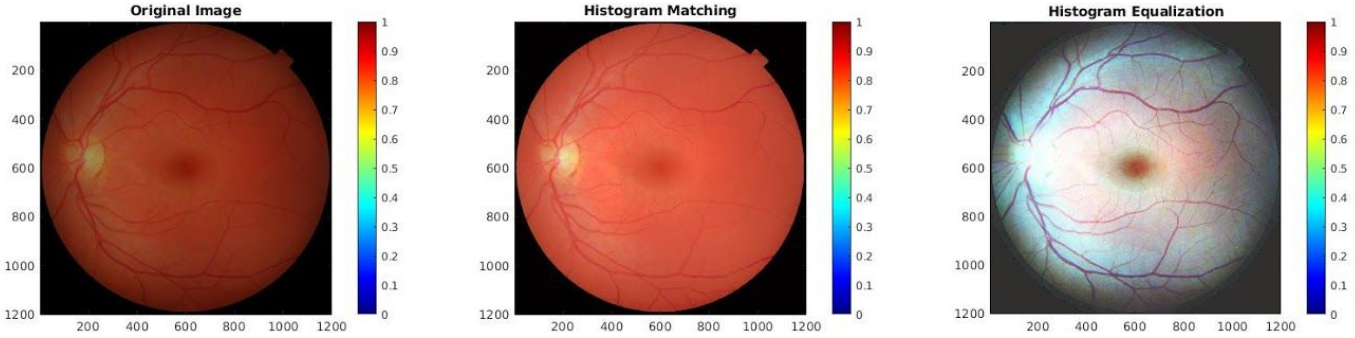

HE
100
200
300
200
400
600
1
0.5
0


Original Image
200
100
0


HE
200
100
0



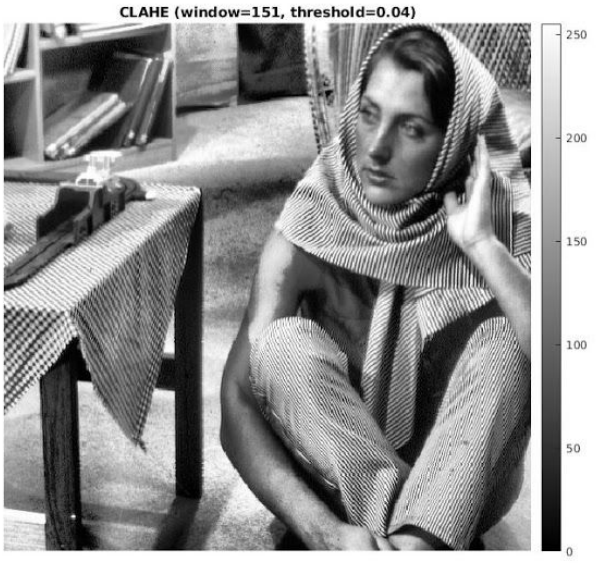
d)

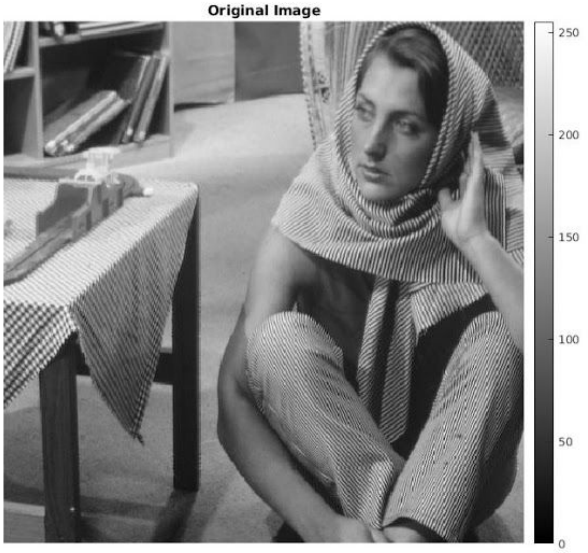


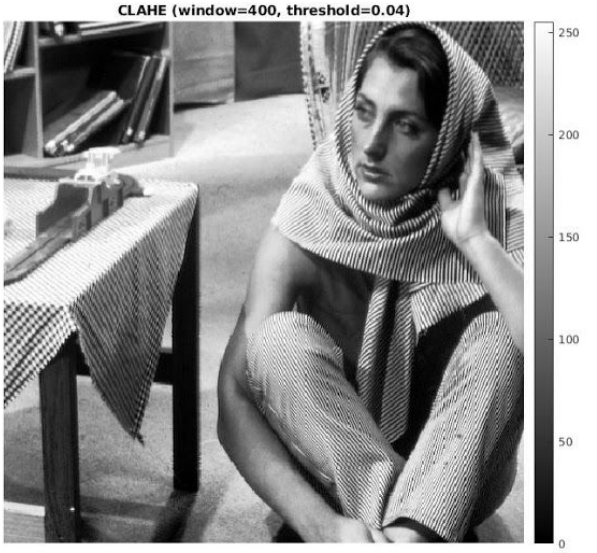
The histogram matched image seems to have closer resemblance with original image. Histogram Equalized image although has a good contrast but lacks the true colours of the original image.

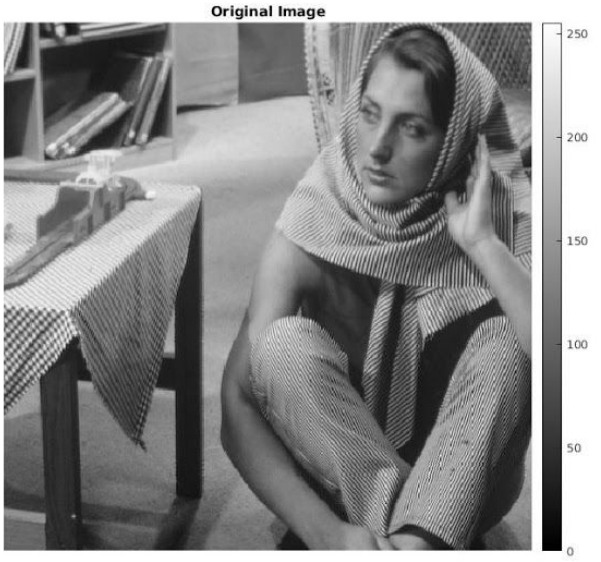
e)

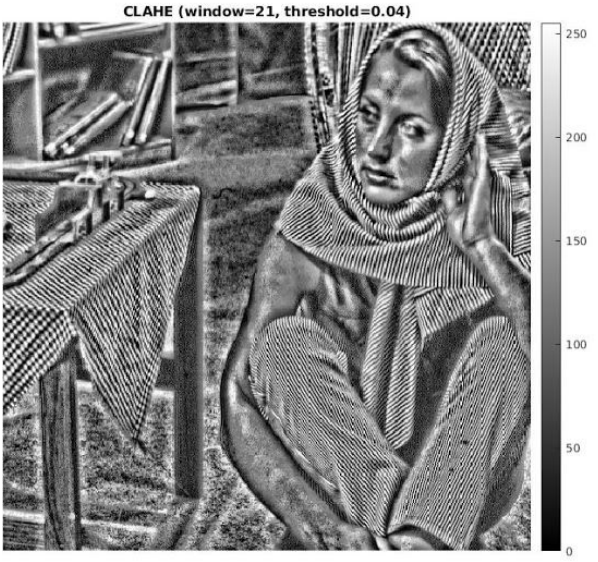

Original Image
250
200
150
100
50
0


CLAHE (window=151, threshold=0.04)
250
200
150
100
50
0

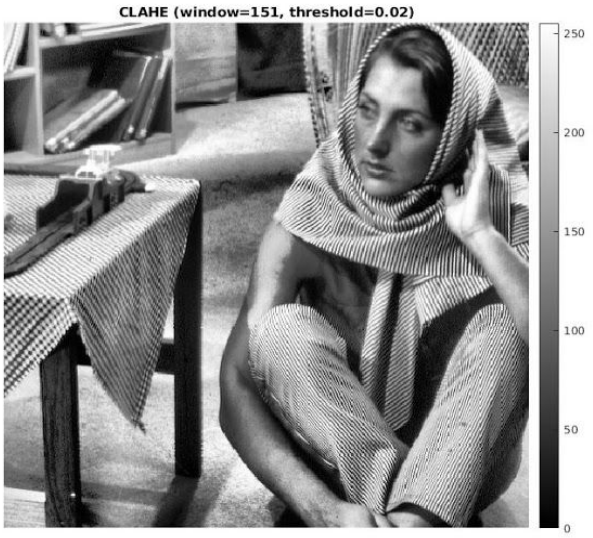

Original Image
250
200
150
100
50
0

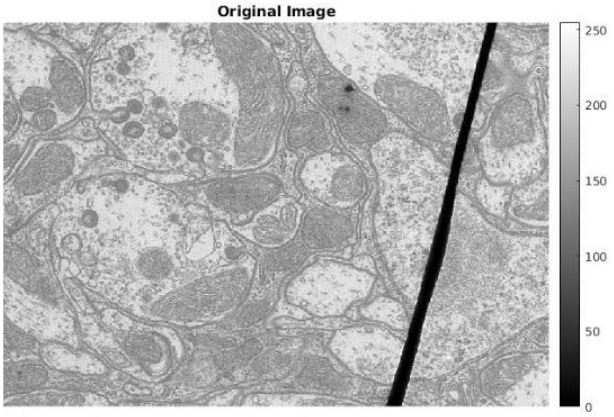

CLAHE (window=400, threshold=0.04)
250
200
150
100
50
0

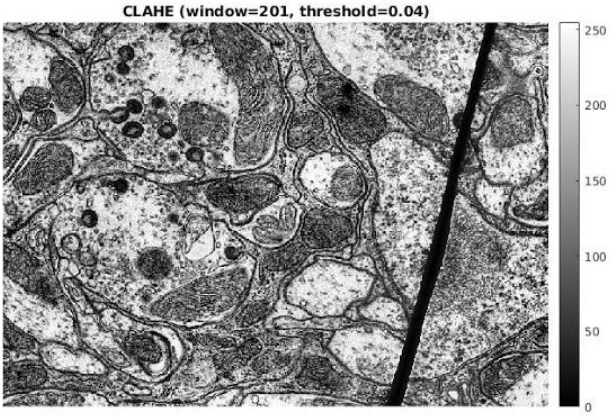

Original Image
250
200
150
100
50
0

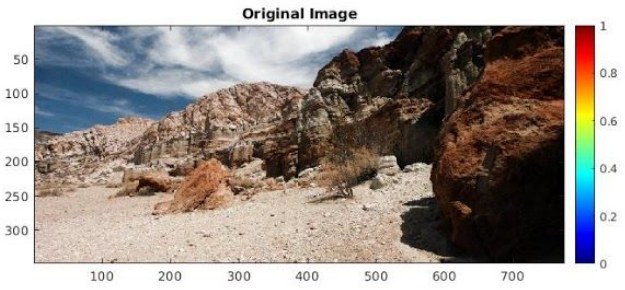

CLAHE (window=21, threshold=0.04)
250
200
150
100
50
0

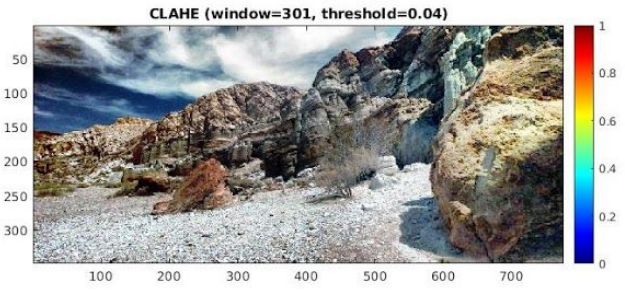

Original Image
250
200
150
100
50
0

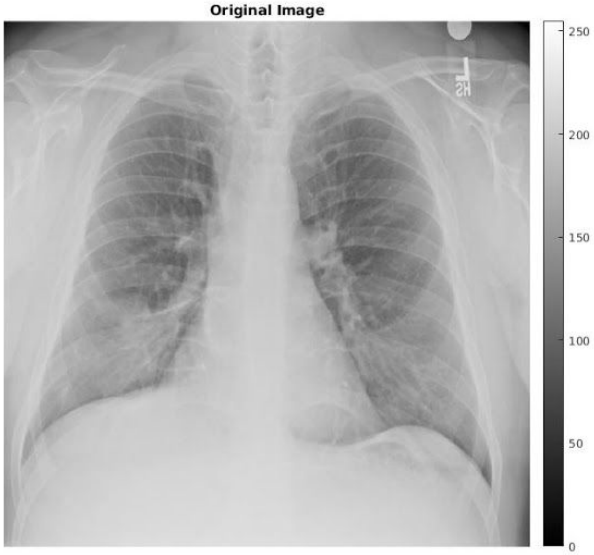

CLAHE (window=151, threshold=0.02)
250
200
150
100
50
0

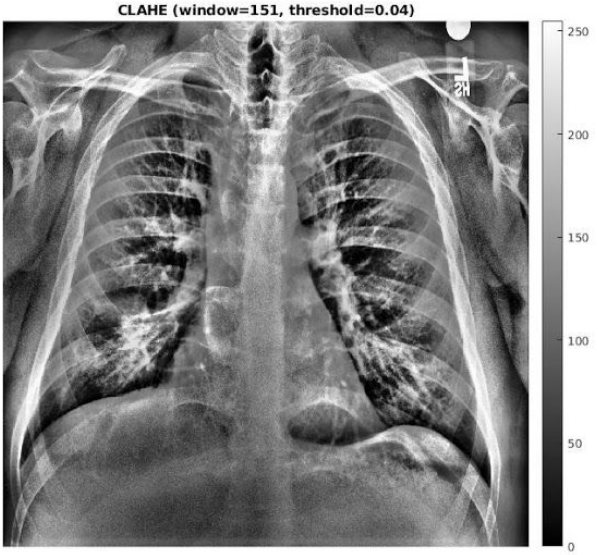

Original Image
250
200
150
100
50
0


CLAHE (window=201, threshold=0.04)
250
200
150
100
50
0


Original Image
50
100
150
200
250
300
100
200
300
400
500
600
700
1
0.8
0.6
0.4
0.2
0


CLAHE (window=301, threshold=0.04)
50
100
150
200
250
300
100
200
300
400
500
600
700
1
0.8
0.6
0.4
0.2
0


Original Image
250
200
150
100
50
0


CLAHE (window=151, threshold=0.04)
250
200
150
100
50
0