Visual Recognition Assignment

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Purpose of this Assignment :

To explore Image Enhancement techniques specially Whitening and Histogram Equalization using the information given in the slides.

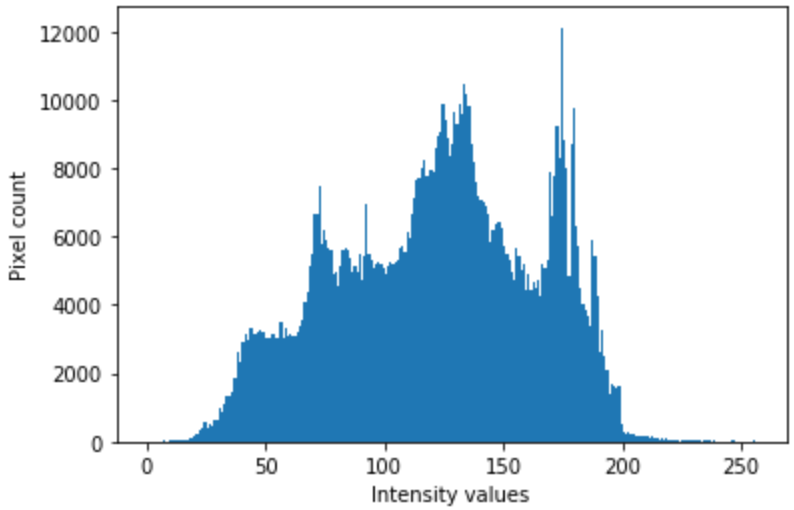
1. Image 1 :

This is the original Image:

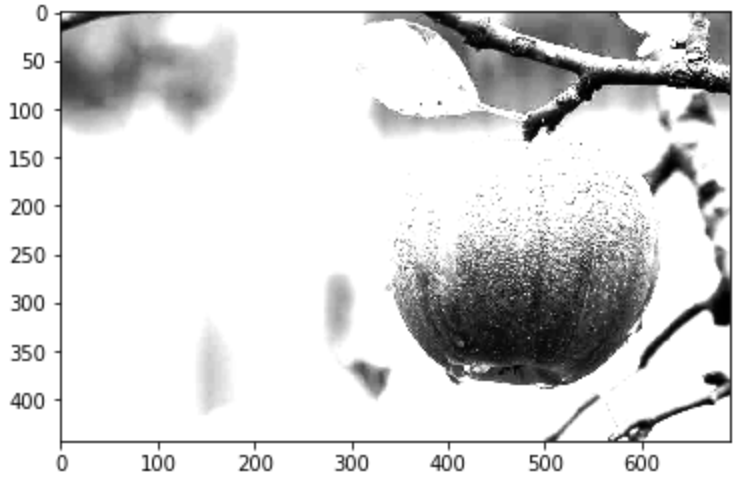
a) Histogram Equalization:

I have plotted the histogram of pixel count for different intensity values of this picture for comparing the histogram after histogram equalization of this picture.

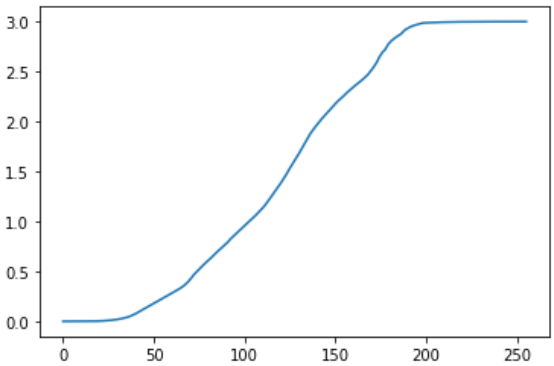
The histogram of the picture before histogram equalization is:



Now after histogram equalization the picture looks like:

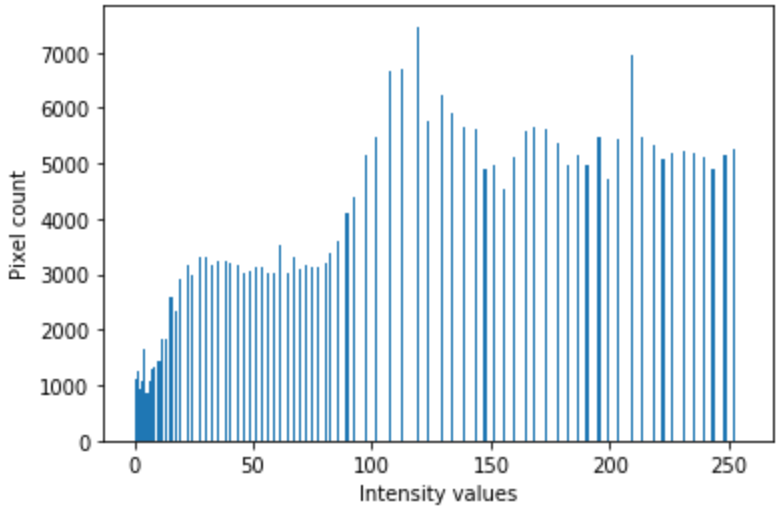


Plot of cumulative frequencies looks like:



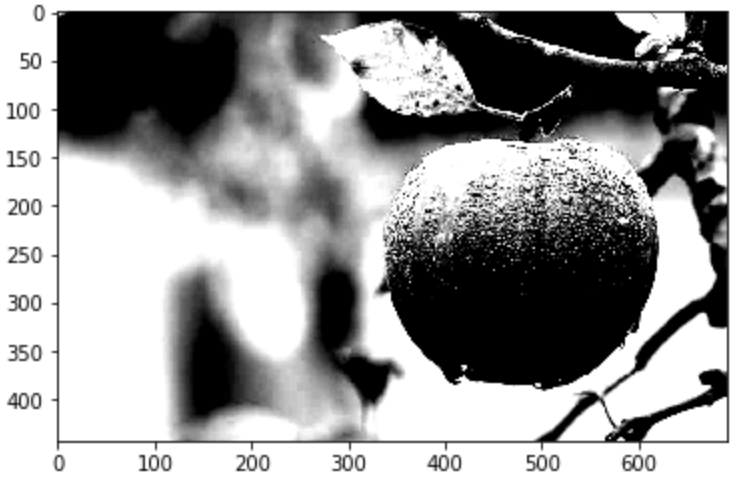
We want to make the plot linear and it looks almost linear.

Histogram of the picture after equalization is:

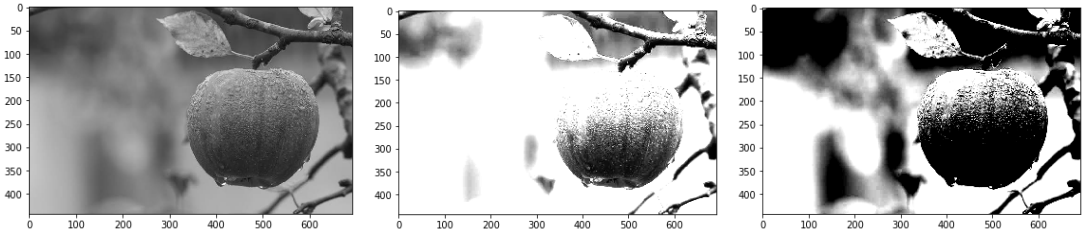


b) Whitening:

The image after whitening looks like



Putting the original, after histogram equalization and after whitening images together :



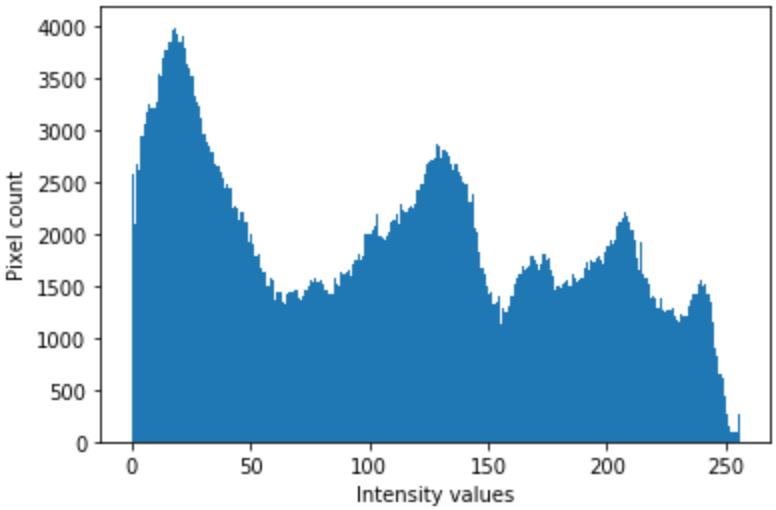
2. Image 2 :

This is the original Image:

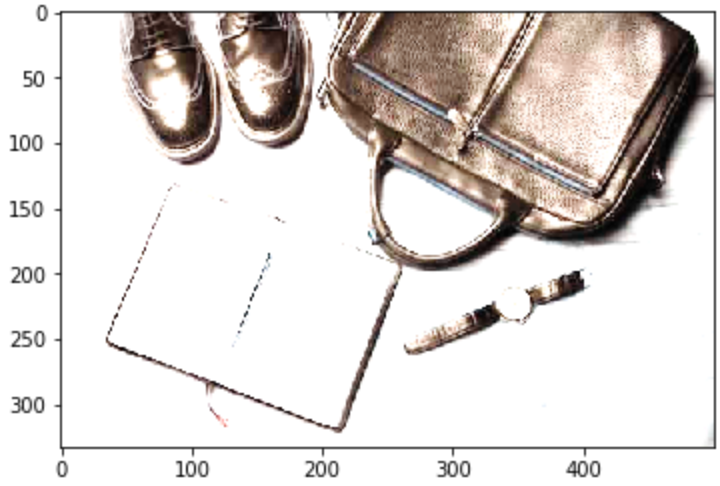
c) Histogram Equalization:

I have plotted the histogram of pixel count for different intensity values of this picture for comparing the histogram after histogram equalization of this picture.

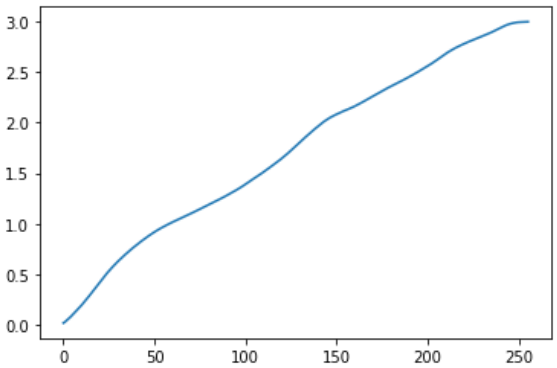
The histogram of the picture before histogram equalization is:



Now after histogram equalization the picture looks like:

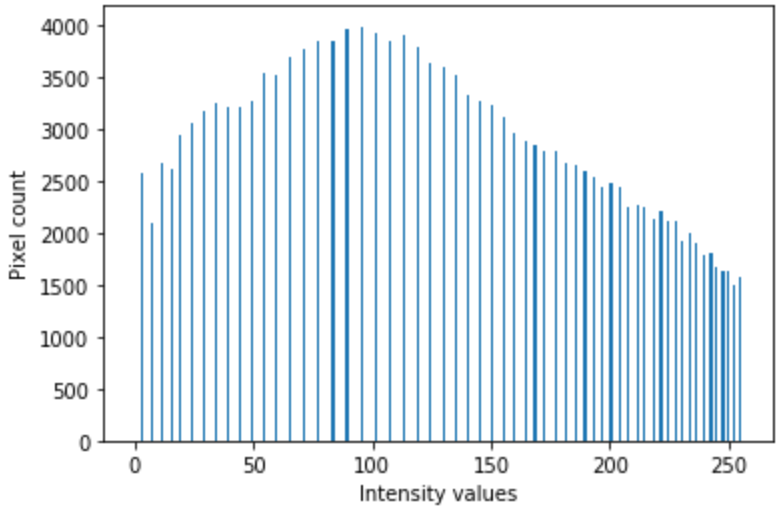


Plot of cumulative frequencies looks like:



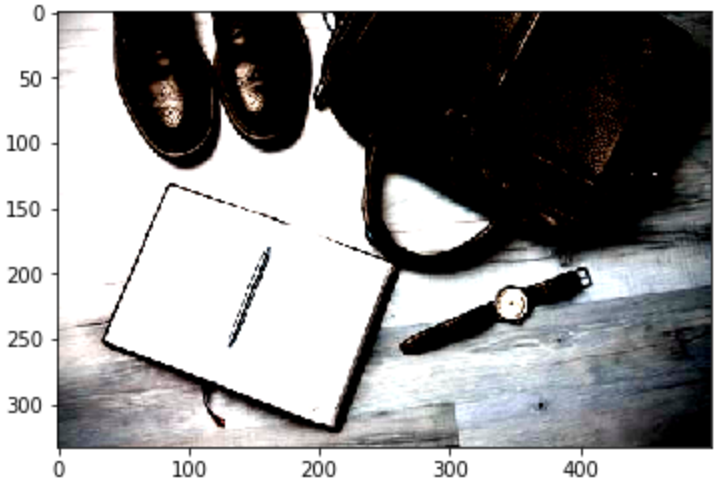
We want to make the plot linear and it looks almost linear.

Histogram of the picture after equalization is:

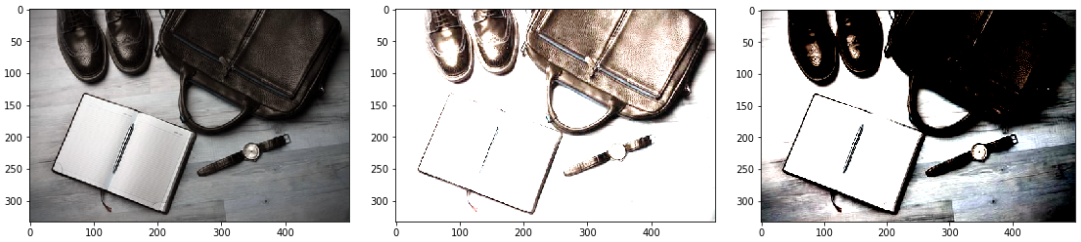


d) Whitening:

The image after whitening looks like



Putting the original, after histogram equalization and after whitening images together :



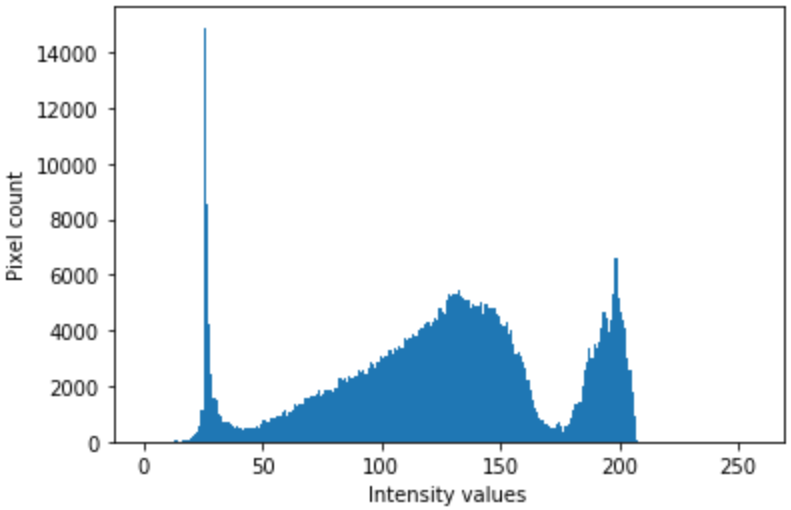
3. Image 3 :

This is the original Image:

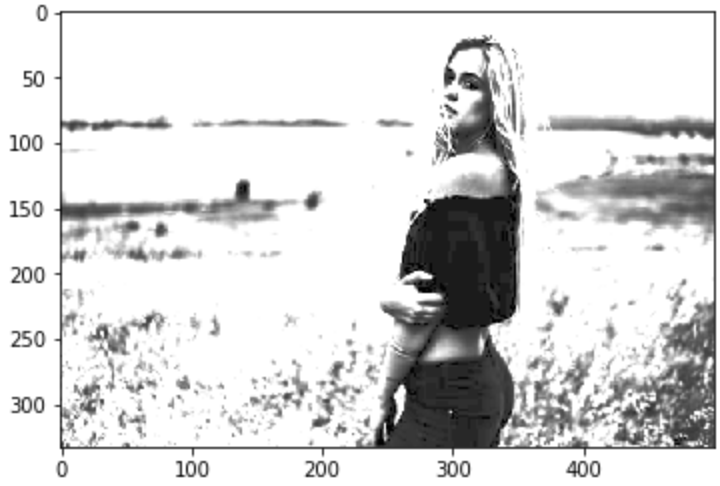
e) Histogram Equalization:

I have plotted the histogram of pixel count for different intensity values of this picture for comparing the histogram after histogram equalization of this picture.

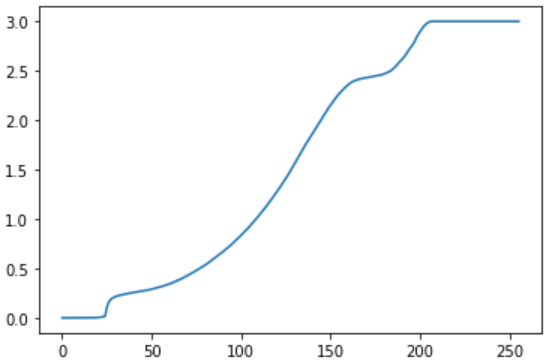
The histogram of the picture before histogram equalization is:



Now after histogram equalization the picture looks like:

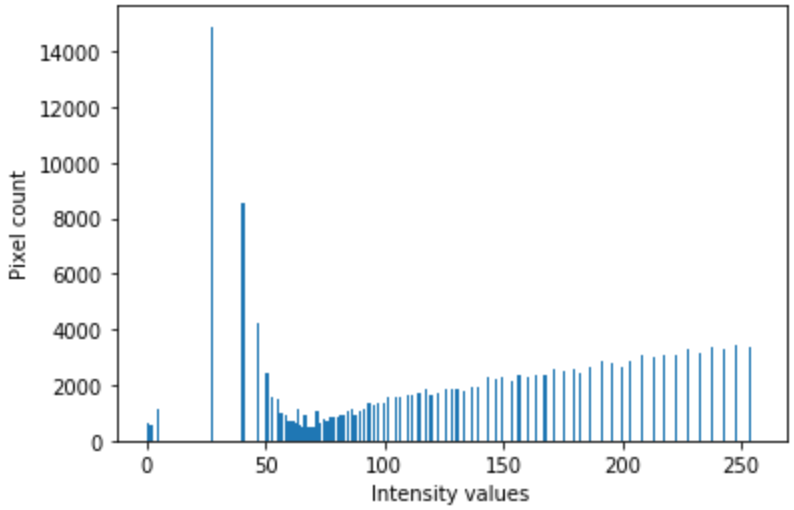


Plot of cumulative frequencies looks like:



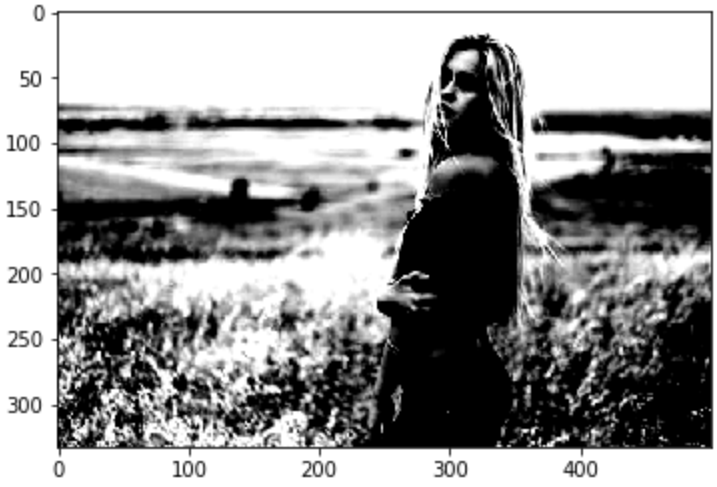
We want to make the plot linear and it looks almost linear.

Histogram of the picture after equalization is:

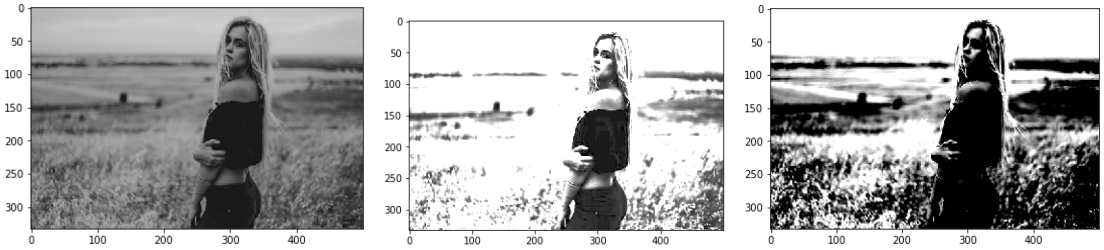


f) Whitening:

The image after whitening looks like



Putting the original, after histogram equalization and after whitening images together :



Observations and Conclusions :

Histogram Equalization is a computer image processing technique used to improve contrast in images . It accomplishes this by effectively spreading out the most frequent intensity values, i.e. stretching out the intensity range of the image. This method usually increases the global contrast of many images, especially when the usable data of the image is represented by close contrast values. Whitening as well helps to whiten the lighter intensity areas more.