Digital Image Processing Lab

Name - Abhishek Maheshwari

Section - E

Roll No - 13

University Roll No - 191500030

Submitted To - Pooja Mam

How to Normalize a Histogram in MATLAB?

CODE:

```
% MATLAB code for
% Histogram normalisation.
% Read the image.
k=imread("lincoln.jfif");

% Convert into grayscale
```

```
k1=rgb2gray(k);

% Display the image and histogram.
imtool(k1,[]);
imhist(k1);

% Set the minimum and maximum
% Values from histogram.
min=45;
max=180;

% Convert image into double.
k2=double(k1);

% Apply the formula.
k3=(k2-min)./(max-min);

% Multiply with maximum possible value.
k4=k3.*255;

% Convert the final result into uint8.
k5=uint8(k4);

% Display the enhanced image and histogram.
imtool(k5,[]);
imhist(k5);
```

OUTPUT:

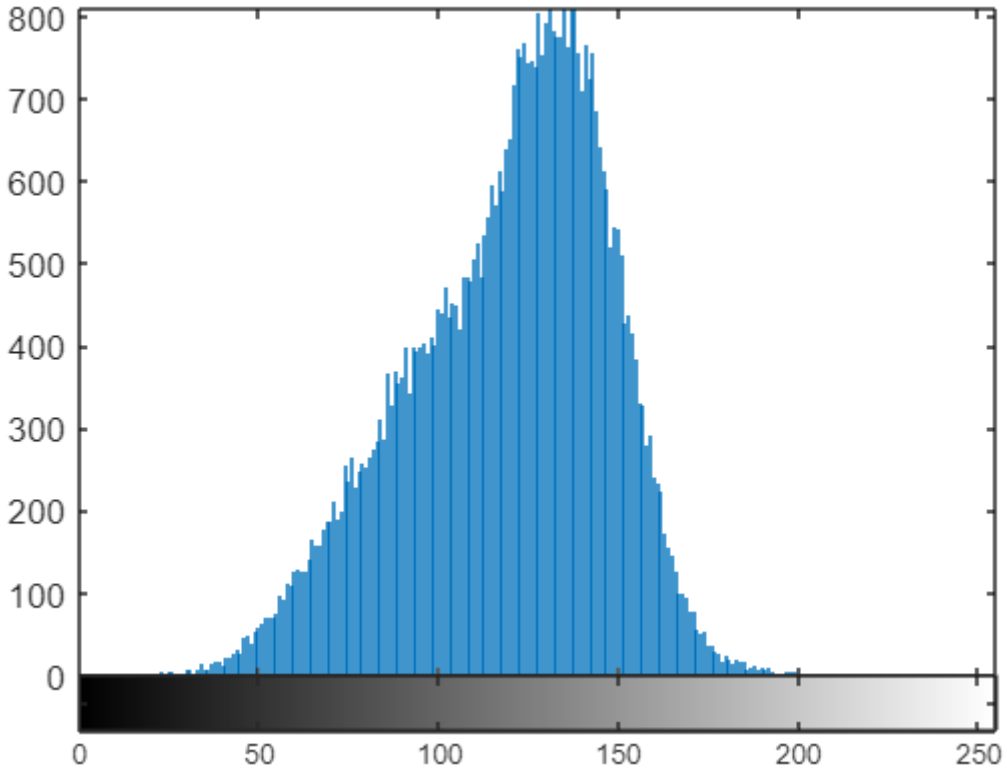

Figure: Original histogram

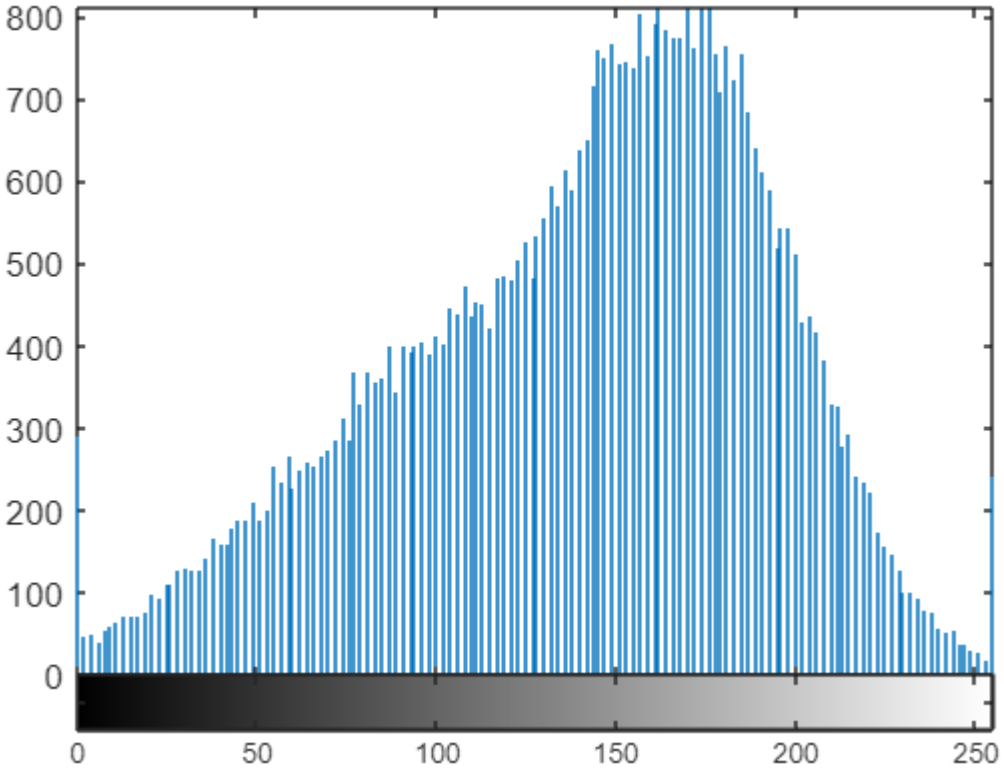

Figure: Normalized histogram

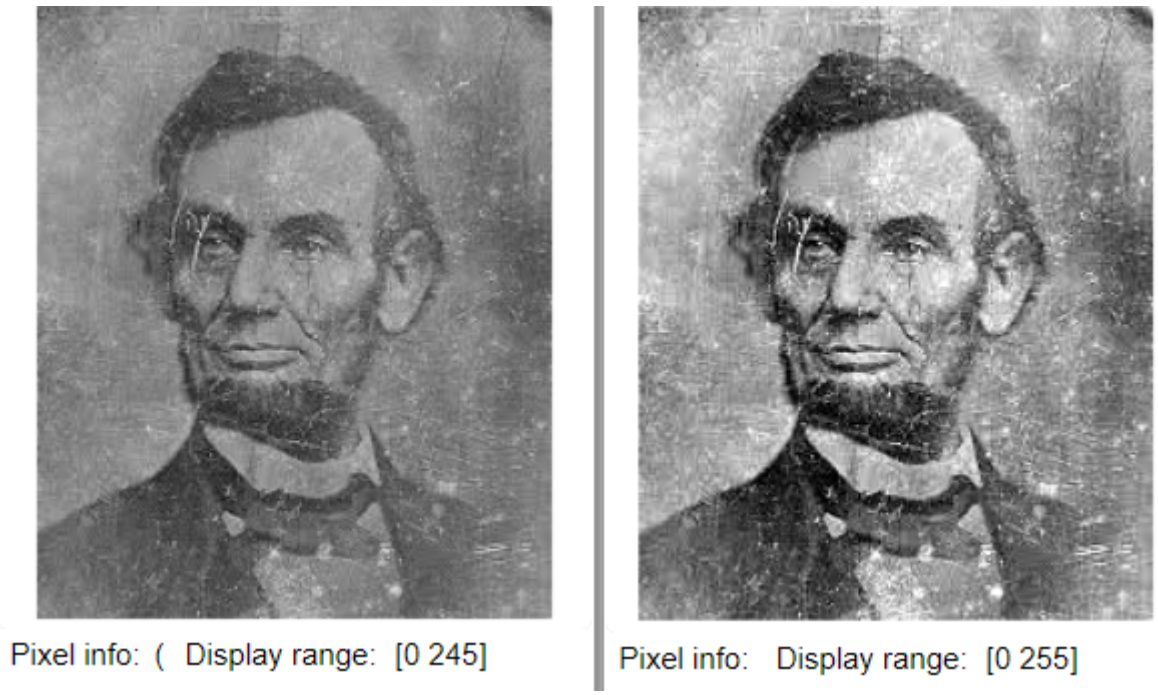

Figure: Images before and after normalization

Matlab code: Histogram equalization without using histeq function

```
GIm=imread('tire.tif');

numofpixels=size(GIm,1)*size(GIm,2);

figure,imshow(GIm);

title('Original Image');
```


```
HIm=uint8(zeros(size(GIm,1),size(GIm,2)));

freq=zeros(256,1);

probf=zeros(256,1);

probc=zeros(256,1);

cum=zeros(256,1);

output=zeros(256,1);

%freq counts the occurrence of each pixel value.
```

```
%The probability of each occurrence is calculated by probf.

for i=1:size(GIm,1)
    for j=1:size(GIm,2)
      value=GIm(i,j);
      freq(value+1)=freq(value+1)+1;
      probf(value+1)=freq(value+1)/numofpixels;
    end
end

sum=0;
no_bins=255;

%The cumulative distribution probability is calculated.
for i=1:size(probf)
   sum=sum+freq(i);
   cum(i)=sum;
   probc(i)=cum(i)/numofpixels;
   output(i)=round(probc(i)*no_bins);
end
```

```
for i=1:size(GIm,1)

    for j=1:size(GIm,2)

            HIm(i,j)=output(GIm(i,j)+1);

    end

end

figure,imshow(HIm);

title('Histogram equalization');
```