

```

% Created by Mohit Talwar
% DIP LAB: Experiment 2
% Histogram Equalization without using inbuilt functions

clc;
clear all;
close all;

[filename, pathname] = uigetfile({'*.jpg;*.png;*.bmp', 'Image Files (*.jpg, *.png, *.bmp)'}, 'Select an Image');
if isequal(filename, 0)
    disp('No file selected. Exiting. ');
    return;
end
imagePath = fullfile(pathname, filename);
img = imread(imagePath);

if size(img, 3) == 3
    gray_img = rgb2gray(img);
else
    gray_img = img;
end

[m, n] = size(gray_img);

img_array = double(gray_img(:));
counts_original = histcounts(img_array, 0:256);

cdf = cumsum(counts_original);
cdf_min = min(cdf(cdf > 0));
L = 255;
h_v = round(((cdf - cdf_min) / ((m * n) - cdf_min)) * (L));
disp(max(cdf));

equalized_img = h_v(gray_img + 1);
counts_equalized = histcounts(equalized_img(:), 0:256);

figure;

subplot(2, 2, 1);
imshow(gray_img);
title('Original Image');

subplot(2, 2, 2);
imshow(uint8(equalized_img));
title('Equalized Image');

subplot(2, 2, 3);
bar(0:255, counts_original, 'FaceColor', 'blue', 'EdgeColor', 'none');
title('Original Histogram');
ylabel('Count');
xlabel('Pixel Intensity');
xlim([0, 255]);

subplot(2, 2, 4);
bar(0:255, counts_equalized, 'FaceColor', 'red', 'EdgeColor', 'none');
title('Equalized Histogram');
ylabel('Count');
xlabel('Pixel Intensity');
xlim([0, 255]);

```

**Original Image****Equalized Image**