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```
clc;
clear;
close all;
```

Step 1: Read Original Image

```
rgb_img = imread('Image.jpeg');
```

Step 2: Convert to Grayscale

```
gray_img = rgb2gray(rgb_img);

[M, N] = size(gray_img);
```

=====

METHOD 1: Histogram Equalization USING histeq

=====

```
histeq_img = histeq(gray_img);
```

=====

METHOD 2: Histogram Equalization WITHOUT histeq (Manual)

=====

```
% Step 1: Compute Histogram
hist = zeros(1,256);
for i = 1:M
    for j = 1:N
        intensity = gray_img(i,j);
        hist(intensity + 1) = hist(intensity + 1) + 1;
```

```

        end
    end

    % Step 2: PDF
    pdf = hist / (M * N);

    % Step 3: CDF
    cdf = zeros(1,256);
    cdf(1) = pdf(1);
    for k = 2:256
        cdf(k) = cdf(k-1) + pdf(k);
    end

    % Step 4: Transformation Function
    T = round(cdf * 255);

    % Step 5: Pixel Mapping
    manual_eq_img = zeros(M,N);
    for i = 1:M
        for j = 1:N
            manual_eq_img(i,j) = T(gray_img(i,j) + 1);
        end
    end

    manual_eq_img = uint8(manual_eq_img);

    =====

    DISPLAY RESULTS (COMPARISON)

    =====

    figure('Name','Histogram Equalization Comparison','NumberTitle','off');

    % Original RGB
    subplot(3,3,1);
    imshow(rgb_img);
    title('Original RGB Image');

    % Original Grayscale
    subplot(3,3,2);
    imshow(gray_img);
    title('Grayscale Image');

    % Original Histogram
    subplot(3,3,3);
    imhist(gray_img);
    title('Grayscale Histogram');

    % histeq Image
    subplot(3,3,4);
    imshow(histeq_img);
    title('histeq Result');

```

```

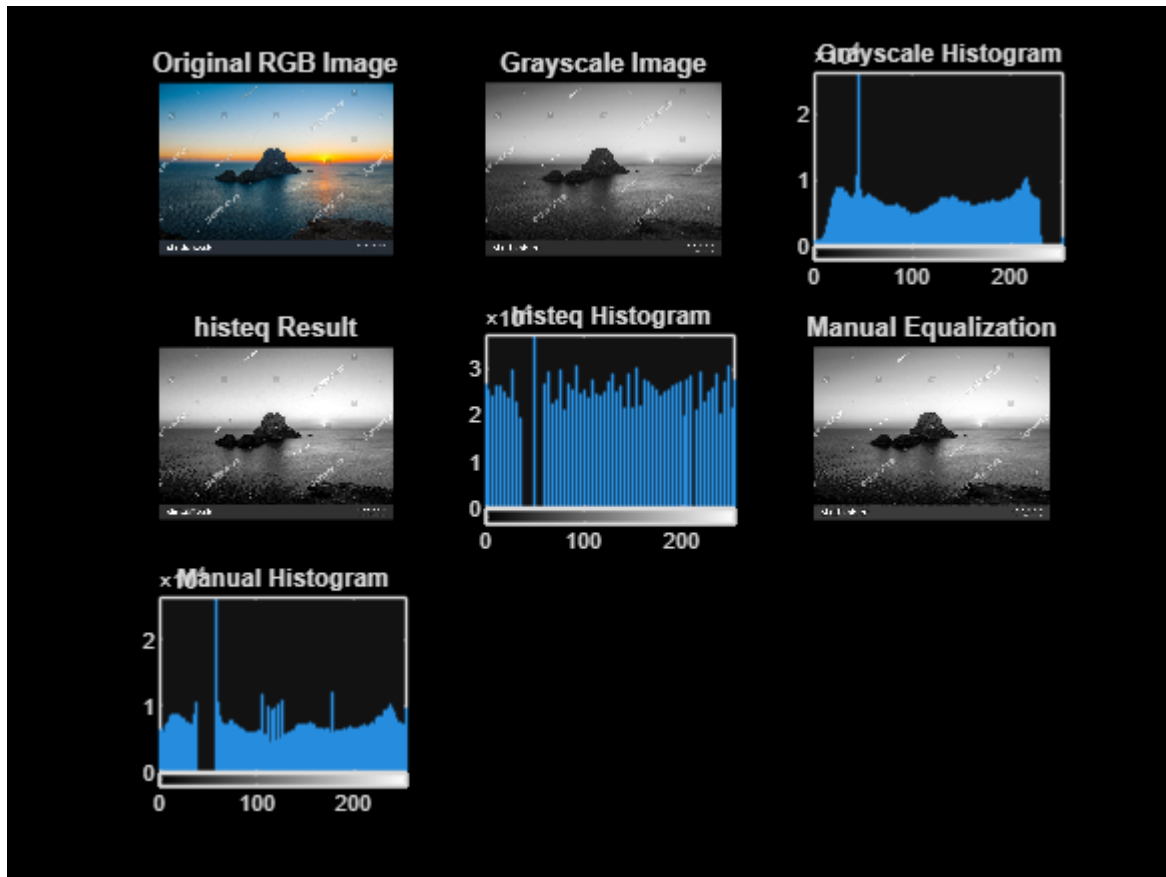
% histeq Histogram
subplot(3,3,5);
imhist(histeq_img);
title('histeq Histogram');

% Manual Equalized Image
subplot(3,3,6);
imshow(manual_eq_img);
title('Manual Equalization');

% Manual Histogram
subplot(3,3,7);
imhist(manual_eq_img);
title('Manual Histogram');

% Empty for symmetry
subplot(3,3,8); axis off;
subplot(3,3,9); axis off;

```



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