EAST WEST UNIVERSITY
Department of Computer Science and Engineering

Lab-report:02

Course Name: Digital Image Processing
Course Code: CSE438
Section No: 03

Submitted To:

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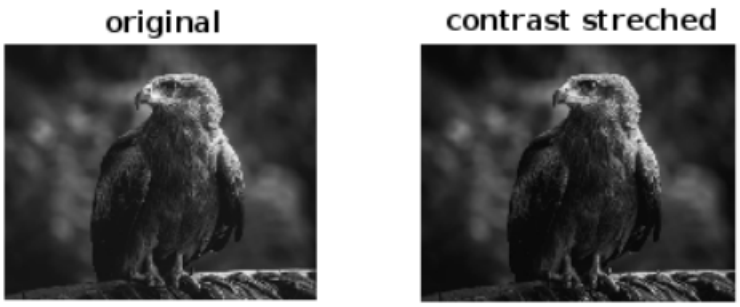
Problem1: Use contrast stretching on the image.

Code:

```
image = imread("img 1.png");
subplot(1,2,1);
imshow(image);
title('original')

x = min(image(:));
y = max(image(:));
image= (image-x)*(255/(y-x));
subplot(1,2,2);
imshow(image);

title('contrast streched')
```

Output:



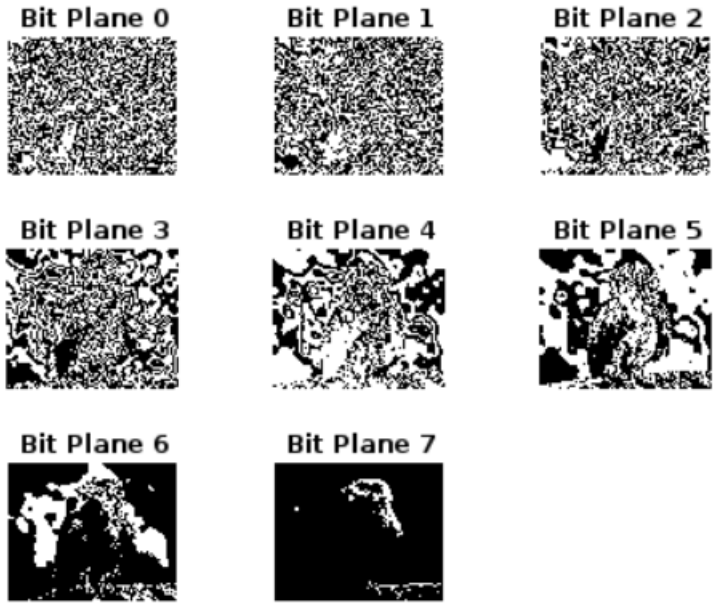
Problem2: Apply bit plane slicing on the image.

Code:

```
img = imread('img 1.png');

bit0 = bitget(img, 1);
bit1 = bitget(img, 2);
bit2 = bitget(img, 3);
bit3 = bitget(img, 4);
bit4 = bitget(img, 5);
bit5 = bitget(img, 6);
bit6 = bitget(img, 7);
bit7 = bitget(img, 8);
```

```
bit0_scaled = bit0 * 255;
bit1_scaled = bit1 * 255;
bit2_scaled = bit2 * 255;
bit3_scaled = bit3 * 255;
bit4_scaled = bit4 * 255;
bit5_scaled = bit5 * 255;
bit6_scaled = bit6 * 255;
bit7_scaled = bit7 * 255;


figure;

subplot(3, 3, 1);
imshow(bit0_scaled, []);
title('Bit Plane 0');

subplot(3, 3, 2);
imshow(bit1_scaled, []);
title('Bit Plane 1');

subplot(3, 3, 3);
imshow(bit2_scaled, []);
title('Bit Plane 2');

subplot(3, 3, 4);
imshow(bit3_scaled, []);
title('Bit Plane 3');

subplot(3, 3, 5);
imshow(bit4_scaled, []);
title('Bit Plane 4');

subplot(3, 3, 6);
imshow(bit5_scaled, []);
title('Bit Plane 5');

subplot(3, 3, 7);
imshow(bit6_scaled, []);
title('Bit Plane 6');

subplot(3, 3, 8);
imshow(bit7_scaled, []);
title('Bit Plane 7');
```

Output:



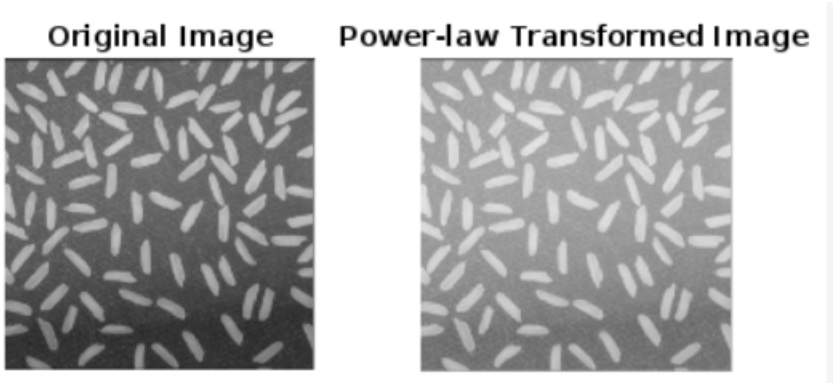
Problem3: Change the contrast of the image using Logarithmic Transformation and Power-law Transformation.

Code:

```
img = imread('img 2.png');

img_double = double(img);


gamma = 0.5;


power_law_transformed_img = 255 * (img_double / 255).^gamma;


power_law_transformed_img_uint8 = uint8(power_law_transformed_img);


subplot(1, 2, 1);
imshow(img);
```

```
title('Original Image');

subplot(1, 2, 2);
imshow(power_law_transformed_img_uint8);
title('Power-law Transformed Image ');
```

Output:



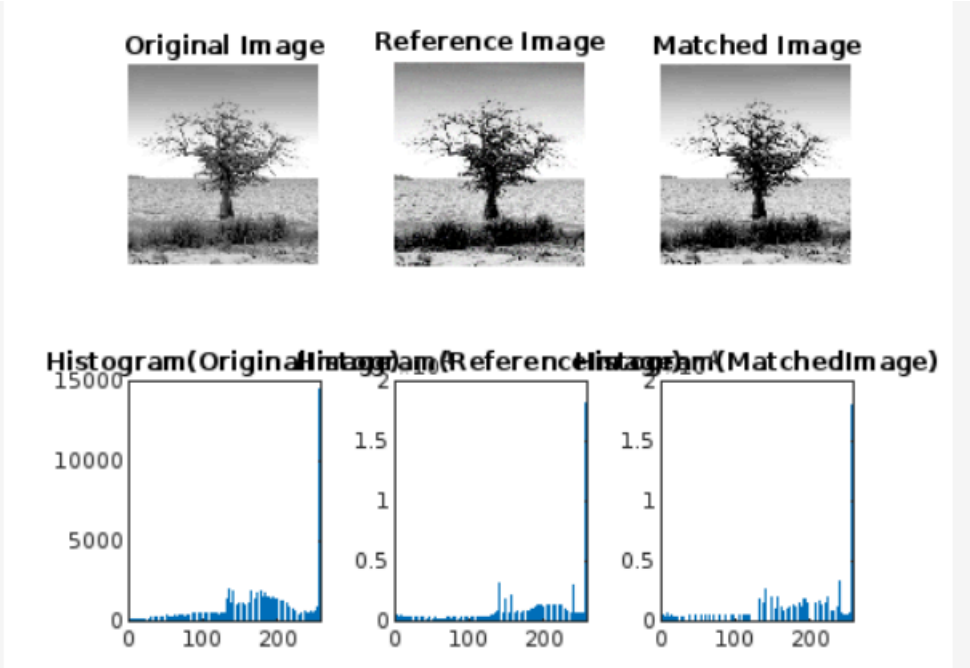
Problem4: Adjust the histogram of the following image to match the reference image using histogram matching. Show the histogram of original, reference, and output images.

Code:

```
original_img = imread('tree.png');


reference_img = imread('reference_tree.png');


matched_img = histeq(original_img, imhist(reference_img));


original_hist = imhist(original_img);
reference_hist = imhist(reference_img);
matched_hist = imhist(matched_img);


figure;

subplot(2, 3, 1);
imshow(original_img);
title('Original Image');

subplot(2, 3, 2);
imshow(reference_img);
title('Reference Image');

subplot(2, 3, 3);
imshow(matched_img);
title('Matched Image');
```

```
subplot(2, 3, 4);
bar(original_hist);
title('Histogram(OriginalImage)');

subplot(2, 3, 5);
bar(reference_hist);
title('Histogram(ReferenceImage)');

subplot(2, 3, 6);
bar(matched_hist);
title('Histogram(MatchedImage)');
```

Output:



Problem5: Change the contrast of the image using histogram equalization. Show the histogram of both input and output images.

Code:

```
img = imread('img 4.png');

equalized_img = histeq(img);


figure;
subplot(2, 2, 1);
imshow(img);
```

```
title('Original Image');

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


subplot(2, 2, 3);
imhist(img);
title('Histogram(Original Image)');

subplot(2, 2, 4);
imhist(equalized_img);
title('Histogram(Equalized Image)');
```

Output: