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Digital Iamge Processing Assignment 1

Q1) Histogram Specification

Given Image1,Image2 as input result is Image3

Code :

```matlab
function []=histogram_specification(image1,image2)
    n=256;
    img1=imread(image1);
    img2=imread(image2);
    img3=img1;
    for k=1:3
        X1=imhist(img1(:,:,k));
        cumulative_matrix = tril(ones(n,n),0);
        N=sum(X1);
        initial_cumulative_sum = round(((cumulative_matrix*X1)*(n-1))/N);
        X2=imhist(img2(:,:,k));
        cumulative_matrix = tril(ones(n,n),0);
        N=sum(X2);
        final_cumulative_sum = round(((cumulative_matrix*X2)*(n-1))/N);
        img4=img1(:,:,k);
        for i=1:n
            temp=find(final_cumulative_sum>initial_cumulative_sum(i),1);
            if isempty(temp)
                z=n-1;
            else
                z=temp-1;
            end
            temp2=find(img1(:,:,k)==(i-1));
            if ~isempty(temp2)

                img4(temp2)=z;
            end
        end
        img3(:,:,k)=img4;
    end

    figure;
    subplot(1,3,1);
    imshow(img1);
    subplot(1,3,2);
    imshow(img2);
    subplot(1,3,3);
    imshow(uint8(img3));
end
```

Q1)
Local Histogram Equalization:

Given Image1 as input result is Image2

window sizes=300,300,size(img),size(img)

Code :

```matlab
function []=local_histogram_equalization(image_name,patch)
    img1=rgb2gray(imread(image_name));
    [X,Y,Z]=size(img1);
    img2=img1;
    n=256;
    cumulative_matrix = tril(ones(n,n),0);
    for k=1:Z
        i=1;
        while(i+patch < X)
            j=1;
            while(j+patch<Y)
                X1=imhist(img1(i:i+patch-1,j:j+patch-1,k),n);
                N=sum(X1);
                initial_cumulative_sum = round(((cumulative_matrix*X1)*(n-1))/N);
                img3=img1(i:i+patch-1,j:j+patch-1,k);

                for z=1:n
                    temp=find(img1(i:i+patch-1,j:j+patch-1,k)==(z-1));
                    if ~isempty(temp)
                        img3(temp)=initial_cumulative_sum(z).*ones(1,size(temp,1));
                    end
                end
                img2(i:i+patch-1,j:j+patch-1)=img3;
                j=j+patch;
            end
            i=i+patch;
        end
    end
    figure;
    subplot(1,2,1);
    imshow(img1);
    subplot(1,2,2);
    imshow(uint8(img2));
end
```