CSE438:Digital Image Processing
[Fall23]

Lab 2

Submitted for
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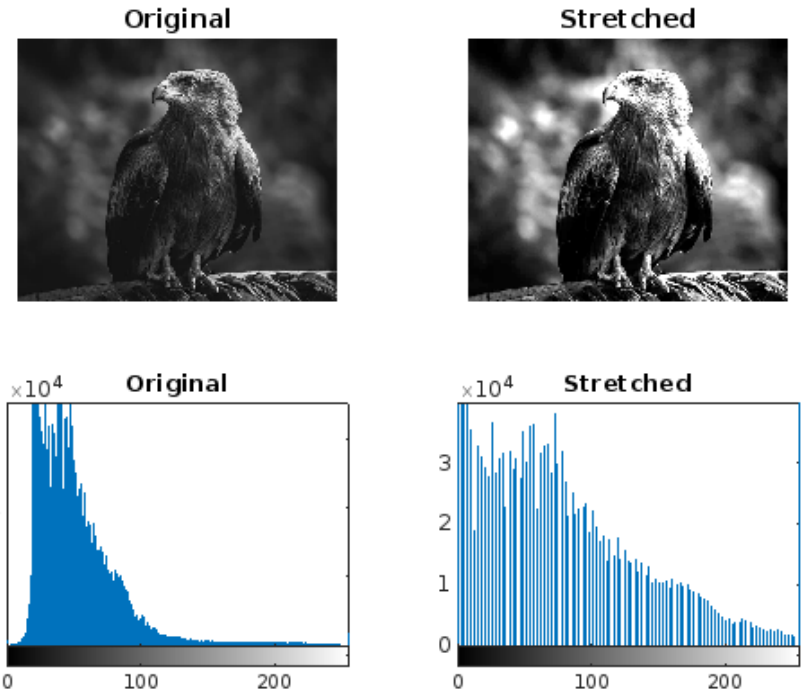
Question 1

```
Img=imread('img1.png');
Img_Stect=imadjust(Img, stretchlim (Img, [0.05,0.95]), []);
subplot(2,2,1),
imshow(Img);
title('Original');
subplot(2,2,2),
imshow(Img_Stect); title('Stretched');
subplot(2,2,3),
imhist(Img);
title('Original');
subplot(2,2,4),
imhist(Img_Stect);
title('Stretched');
```



Question 2

```
p2 = imread('img1.png');
p2= double (p2);
Bit_scling= bitget (p2,1);
subplot(3,3,1); imshow(Bit_scling); title('Plane 1');
Bit_scling= bitget (p2,2);
subplot(3,3,2); imshow(Bit_scling); title('Plane 2');
Bit_scling= bitget (p2,3);
subplot(3,3,3); imshow(Bit_scling); title('Plane 3');
Bit_scling= bitget (p2,4);
subplot(3,3,4); imshow(Bit_scling); title('Plane 4');
Bit_scling= bitget (p2,5);
subplot(3,3,5); imshow(Bit_scling); title('Plane 5');
Bit_scling= bitget (p2,6);
subplot(3,3,6); imshow(Bit_scling); title('Plane 6');
Bit_scling= bitget (p2,7);
subplot(3,3,7); imshow(Bit_scling); title('Plane 7');
Bit_scling= bitget (p2,8);
subplot(3,3,8); imshow(Bit_scling); title('Plane 8');
Bit_scling= bitget (p2,9);
subplot(3,3,9); imshow(Bit_scling); title('Plane 9');
```

Plane 1

Plane 2

Plane 3

Plane 4

Plane 5

Plane 6

Plane 7

Plane 8

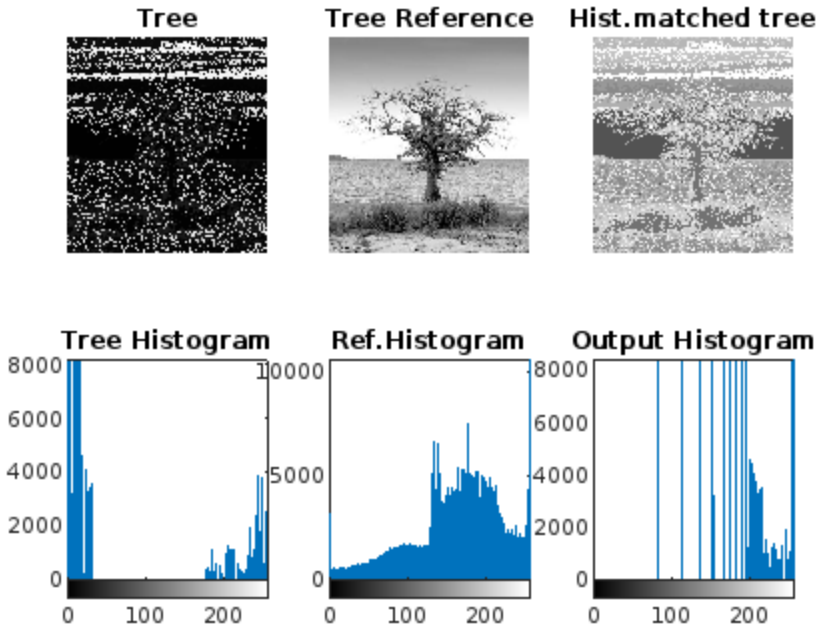
Plane 9

Question 3

```
p3=imread('img2.png');
p3=im2double(p3);
x = p3;
y = p3;
constant=0.5;
gama=0.2;
[r,c]=size(p3);
for i = 1:r
for j = 1:c
x(i,j)=constant*log(1+p3(i,j));
y(i,j)=constant*p3(i,j).^0.2;
end
end
subplot(2,3,1); imshow(p3); title('Original');
subplot(2,3,2); imshow(x); title('Logarithmic Trans.');
subplot(2,3,3); imshow(y); title('Power-Law Trans.');
```

Question 4

```
p4_1 = imread('img3.png');
p4_2 = imread('img4.png');
M = zeros(256, 1, 'uint8');
hist1 = imhist(p4_1);
hist2 = imhist(p4_2);
cdf1 = cumsum(hist1) / numel(p4_1);
cdf2 = cumsum(hist2) / numel(p4_2);
for idx = 1 : 256
   diff = abs(cdf1(idx) - cdf2);
   [~, ind] = min(diff);
   M(idx) = ind-1;
end
out = M(double(p4_1) + 1);
figure;
subplot(2, 3, 1), imshow(p4_1);
title('Tree');
subplot(2, 3, 2), imshow(p4_2);
title('Tree Reference');
subplot(2, 3, 3), imshow(out);
title('Hist.matched tree');
subplot(2, 3, 4), imhist(p4_1);
title('Tree Histogram');
subplot(2, 3, 5), imhist(p4_2);
title('Ref.Histogram');
subplot(2, 3, 6), imhist(out);
title('Output Histogram');
```


Tree
Tree Reference
Hist.matched tree
Tree Histogram
Ref.Histogram
Output Histogram
8000
6000
4000
2000
0
10000
5000
0
100
200

Question 5

```
p5 = imread("img5.png");
figure;
subplot(1,2,1),imshow(p5);
subplot(1,2,2),imshow(p5);
image = imadjust(p5,[0.3,0.6],[0.0,1.0]);
image1 = histeq(p5);
figure;
subplot(2,2,1),imshow(image);title('Stretched');
subplot(2,2,2),imshow(image);
subplot(2,2,2),imhist(image);
subplot(2,2,1);imshow(p5);
subplot(2,2,2);imhist(p5);
subplot(2,2,3);imshow(p5);
subplot(2,2,3);imshow(image1);title('Histogram. Equ.');
subplot(2,2,4);imhist(image1);
```