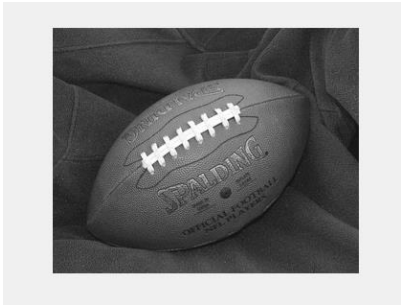
Lab 1

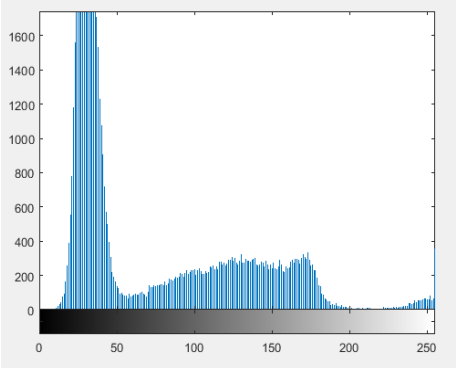
1. Convert RGB Image To Grayscale Image

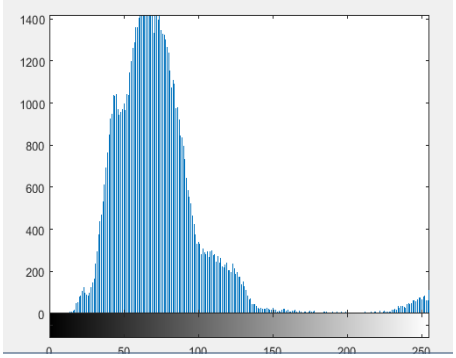
```
im=imread('football.jpg');
I=rgb2gray(im);
imshow(I);
```

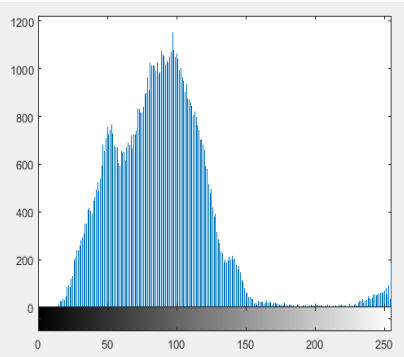


2. Separate R,G And B From an image and show histograms

```
im=imread('football.jpg');

imR=im(:,:,1);
imG=im(:,:,2);
imB=im(:,:,3);

figure(1),imshow(imR);
figure(2),imshow(imG);
figure(3),imshow(imB);

figure(4),imhist(imR);
figure(5),imhist(imG);
figure(6),imhist(imB);
```







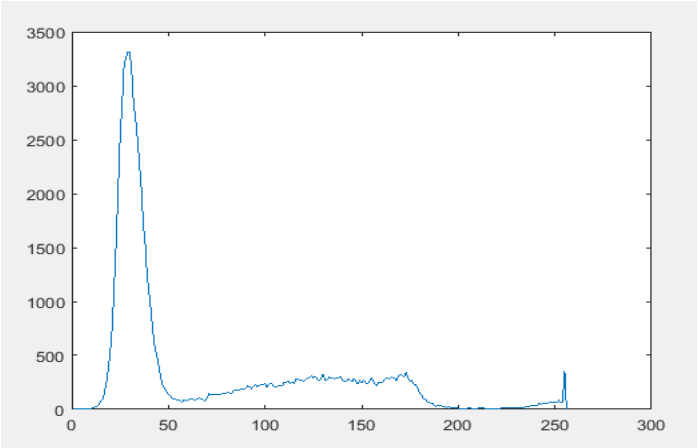
4. Create a binary image from a grayscale image

```
im=imread('football.jpg');
imR=im(:,:,1);

for i=1:256
    for j=1:320

        if(imR(i,j)>60)
            im2(i,j)=255;
        else
            im2(i,j)=0;
       end
    end
end

figure(1),imshow(im2);
```

5. Create a custom histogram from an image

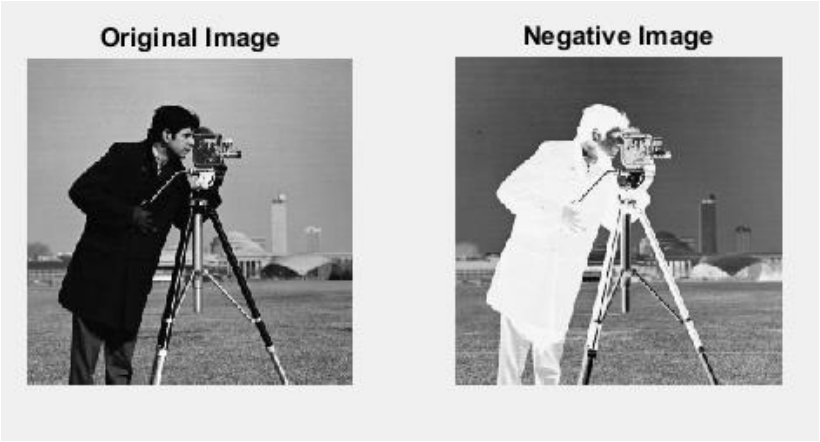
```
im=imread('football.jpg');
imR=im(:,:,1);
im3=1:1:256;

for k=1:256
    im3(k)=0;
end

for i=1:256
    for j=1:320
        im3(imR(i,j))=im3(imR(i,j))+1;
    end
end
```

```
X=1:1:256;
Y=im3(X);

figure(2),plot(X,Y);
```



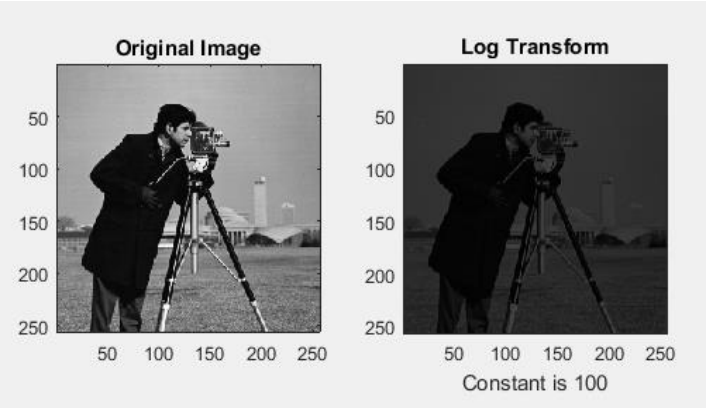
6. Create a negative image from a grayscale image

```
imc=imread('cameraman.tif');

[m,n]=size(imc);

for i=1:m
    for j=1:n

        s(i,j)=256-1-imc(i,j);   % s=l-1-r
    end
end

subplot(1,2,1);imshow(imc);title('Original Image');
subplot(1,2,2);imshow(s);title('Negative Image');
```



7. Log Transform of an image

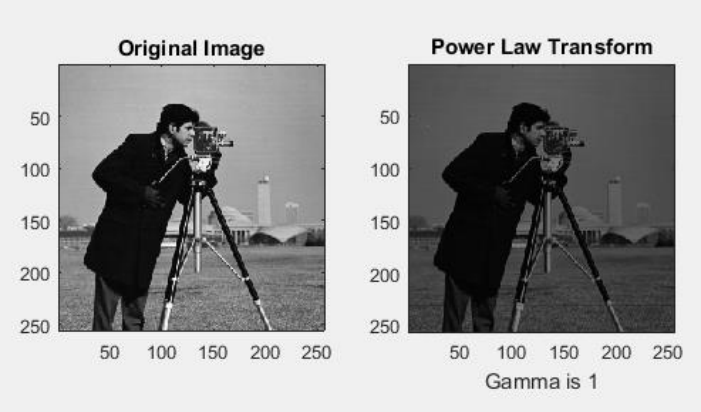
```
A=input('Enter the value of constant A=');
a=imread('cameraman.tif');
[m,n]=size(a);
b=im2double(a);

for i=1:m
    for j=1:n

        r=b(i,j);
        s(i,j)=A*log(r+1);
    end
end

figure,
subplot(1,2,1);subimage(a);title('Original Image');
subplot(1,2,2);subimage(uint8(s));title('Log
Transform');xlabel(sprintf('Constant is %g',A));
```



8. Power law transform of an image

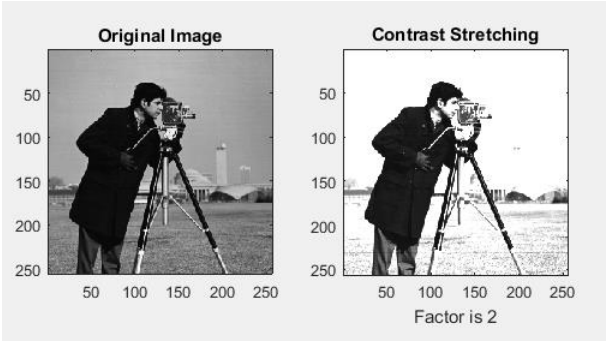
```
 A=input('Enter Constant Value=');
x=input('Enter gamma value=');
a=imread('cameraman.tif');
[m,n]=size(a);

for i=1:m
    for j=1:n

        s(i,j)=A*(a(i,j)^x);
    end
end

figure,
subplot(1,2,1);subimage(a);title('Original Image');
```

```
subplot(1,2,2);subimage(s);title('Power Law
Transform');xlabel(sprintf('Constant is %g',A));
xlabel(sprintf('Gamma is %g',x));
```



9. Contrast Stretching Of an Image

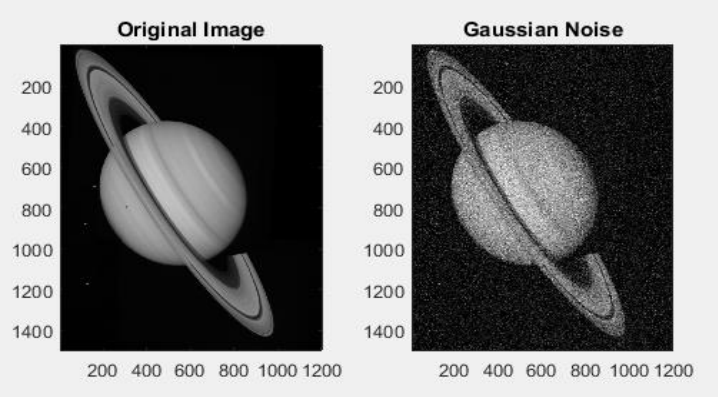
```
x=input('Enter factor value=');
a=imread('cameraman.tif');
[m,n]=size(a);

for i=1:m
    for j=1:n

        s(i,j)=x*(a(i,j));
    end
end

figure,
subplot(1,2,1);subimage(a);title('Original Image');
subplot(1,2,2);subimage(s);title('Contrast
Stretching');xlabel(sprintf('Factor is %g',x));
```



Lab 2

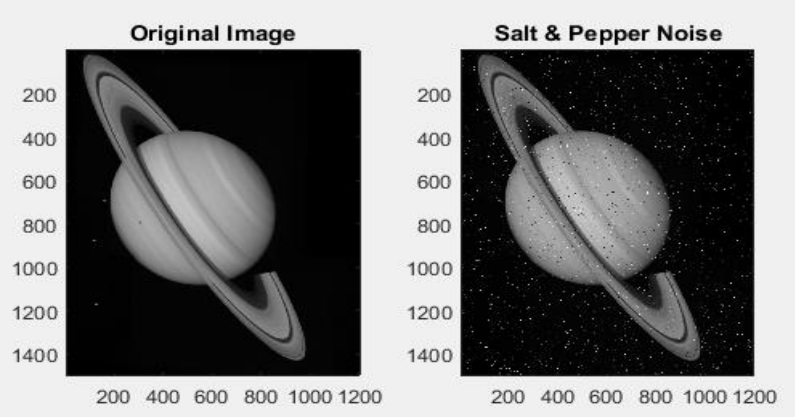
1. Gaussian Noise

```
a=imread('saturn.png');
gr=rgb2gray(a);

n=imnoise(gr,'gaussian',0,0.025);

subplot(1,2,1);subimage(gr);title('Original Image');
subplot(1,2,2);subimage(n);title('Gaussian Noise');
```



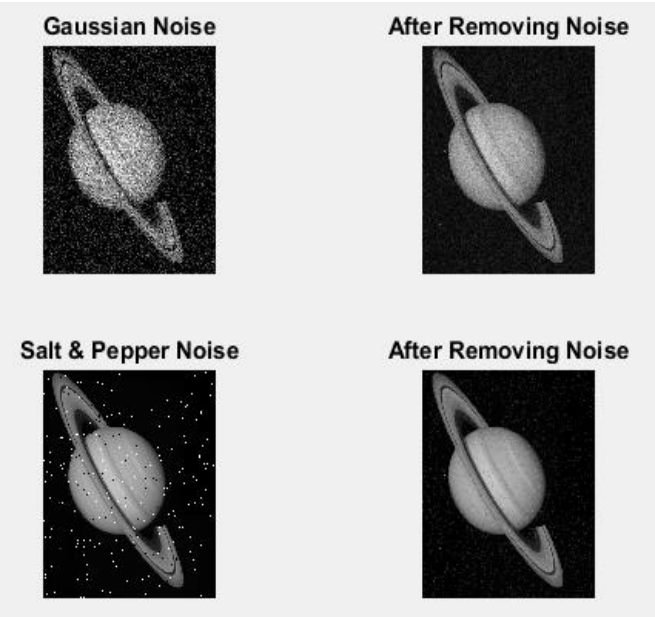
2. Salt Pepper Noise

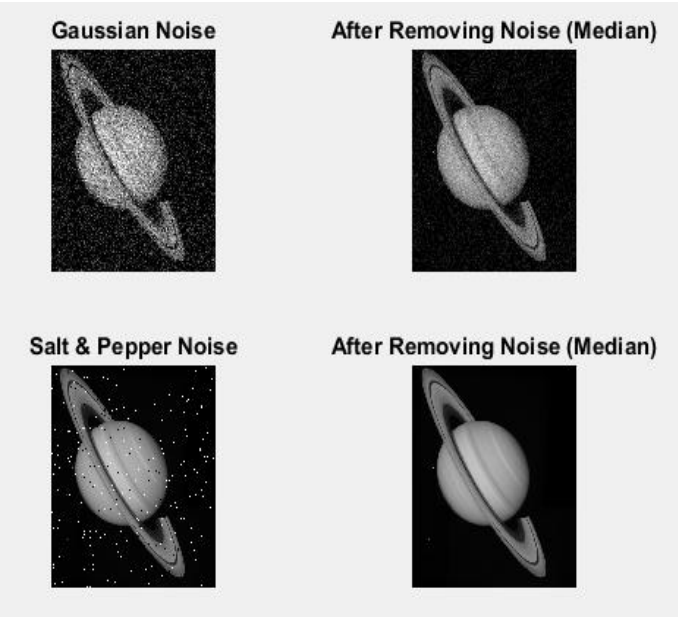
```
a=imread('saturn.png');
gr=rgb2gray(a);
n=imnoise(gr,'salt & pepper',0.02);
subplot(1,2,1);subimage(gr);title('Original Image');
subplot(1,2,2);subimage(n);title('Salt & Pepper Noise');
```



3. Applying Mask And Median Filter To Remove Noise

```
a=imread('saturn.png');
gr=rgb2gray(a);

gr=im2double(gr);

n1=imnoise(gr,'gaussian',0,0.025);
n2=imnoise(gr,'salt & pepper',0.02);

mask=ones(3,3)/9;

r1=imfilter(n1,mask);
r2=imfilter(n2,mask);

r3=medfilt2(n1);
r4=medfilt2(n2);


figure(1);
subplot(2,2,1);imshow(n1);title('Gaussian Noise');
subplot(2,2,2);imshow(r1);title('After Removing Noise');
subplot(2,2,3);imshow(n2);title('Salt & Pepper Noise');
subplot(2,2,4);imshow(r2);title('After Removing Noise');

figure(2);
subplot(2,2,1);imshow(n1);title('Gaussian Noise');
subplot(2,2,2);imshow(r3);title('After Removing Noise (Median)');
subplot(2,2,3);imshow(n2);title('Salt & Pepper Noise');
subplot(2,2,4);imshow(r4);title('After Removing Noise (Median)');
```





4. Edge Detection

```
A=imread('peppers.png');
B=rgb2gray(A);

C=double(B);


for i=1:size(C,1)-2
    for j=1:size(C,2)-2
        %Sobel mask for x-direction:
        Gx=((2*C(i+2,j+1)+C(i+2,j)+C(i+2,j+2))-(2*C(i,j+1)+C(i,j)+C(i,j+2)));
        %Sobel mask for y-direction:
        Gy=((2*C(i+1,j+2)+C(i,j+2)+C(i+2,j+2))-(2*C(i+1,j)+C(i,j)+C(i+2,j)));

        %The gradient of the image
        %B(i,j)=abs(Gx)+abs(Gy);
        B(i,j)=sqrt(Gx.^2+Gy.^2);

    end
end
figure,imshow(B); title('Sobel gradient');

[m,n]=size(B);

for i=1:m
    for j=1:n

        if(B(i,j)>100)
            im2(i,j)=0;
        else
            im2(i,j)=255;
        end
    end
end

figure(1),imshow(im2);
```

5. InterPolation

```
im=imread('football.jpg');
a=imresize(im,0.5,'nearest');
b=imresize(im,0.5,'bilinear');
c=imresize(im,0.5,'bicubic');
figure;
subplot(1,3,1);imshow(a);title('Nearest');
subplot(1,3,2);imshow(b);title('Bilinear');
subplot(1,3,3);imshow(c);title('Bicubic');
```