

Homework 3- Some Noises

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Original image:



```
%%upload image ---MAIN-----
```

```
clc;
```

```
close all;
```

```
[fname, path] = uigetfile('*.jpg', 'Select an Image');
```

```
fname = strcat(path,fname);
```

```
im = imread(fname);
```

```
im2 = im2double(imread(fname));
```

```
%gaussian_noise(im);    %add gaussian noise
```

```
%saltPepper_noise(im); %add salt and pepper noise
```

```
%medianFilter(im,4);    %removed gaussian and salt&pepper noise
```

```
%%periodic_noise(im);   %add periodic noise
```

Salt and Pepper noise:

```
function out = saltPepper_noise(im)

J = im;

p3= 0.05;

x = rand(size(J));%n*n boyutun 0-1 arası elemanları olan matrix üretir

d = find(x < p3/2);%find() sıfır olmayan indisleri verir

J(d) = 0; %Minimum valued

d= find(x >= p3/2 & x < p3);

J(d) = 255; %Maximum(saturated) valueimshow(J)

imwrite(J, 'salt&pepper.jpg', 'quality', 95);%%salt and pepper noise image save

figure;

subplot(121)

imshow(im)

title('Original Image')

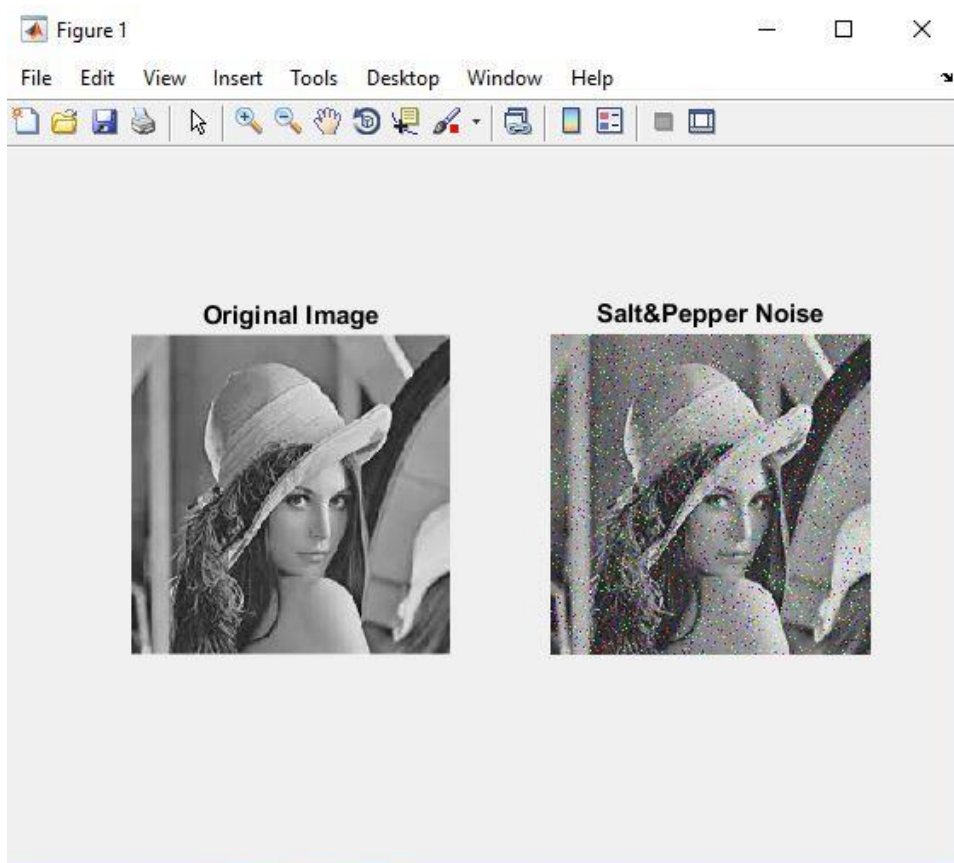
subplot(122)

imshow(J)

title('Salt&Pepper Noise')

end
```

Output1:



Gaussian noise:

```
function out = gaussian_noise(im)

J = im;

p3= 0;p4 = 0.05;

J = im2double(J);

b = J + sqrt(p4)*randn(size(J)) + p3;

imwrite(b, 'gaussian.jpg', 'quality', 95);%%gaussian noise image save


figure;

subplot(121)

imshow(im)

title('Original Image')

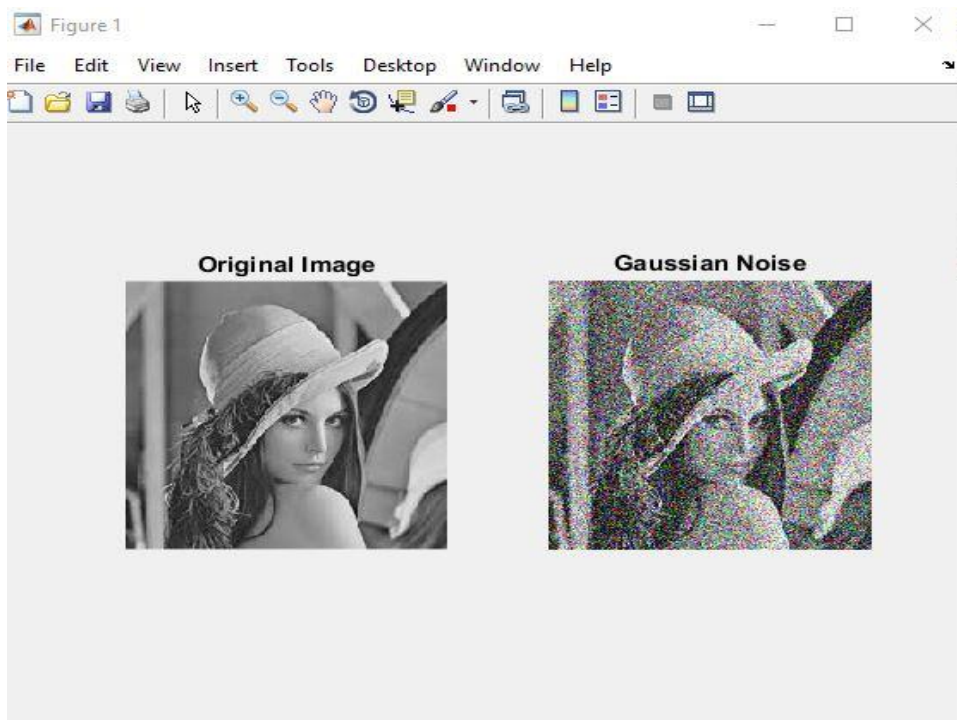
subplot(122)

imshow(b)

title('Gaussian Noise')

end
```

Output2:



Removed Salt & Pepper noise and Gaussian noise with median filter technique:

%removes salt and pepper noise from image.

%removes gaussian noise from image.

%With median filter, gaussian and salt and pepper noise are removed

```
function out = medianFilter(Im,n)
```

```
[height,width] = size(Im);
```

```
Im1 = double(Im);
```

```
out = Im1;
```

```
center = round((n+1)/2);
```

```
for i = 1:height-n+1
```

```
    for j = 1:width-n+1
```

```
        temp = Im1(i:i+n-1,j:j+n-1);
```

```
        ele = temp(1,:);
```

```
        for count = 2:n
```

```
            ele = [ele,temp(count,:)];
```

```
        end

        med = median(ele);

        out(i+center,j+center) = med;

    end

end

out = uint8(out);

figure

subplot(2,1,1)

imshow(Io)

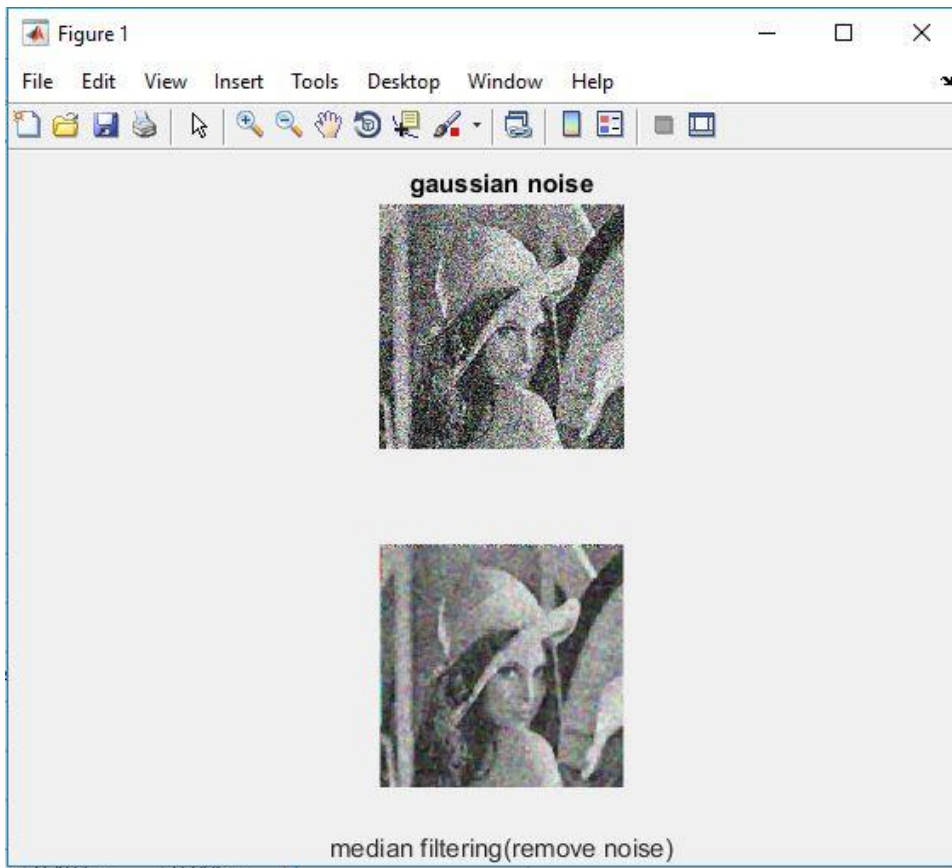
subplot(2,1,2)

imshow(out)

xlabel('median filtering(remove noise)')

end
```

Output3:



Periodic noise:

```
function out = periodic_noise(im)
```

```
im2=double(im);
```

```
s=size(im);
```

```
[x,y]=meshgrid(1:s(1),1:s(2));
```

```
p=round(50*sin(x./3+y./5)+1);
```

```
im2(:,1)=im2(:,1)+p;
```

```
im2(:,2)=im2(:,2)+p;
```

```
im2(:,3)=im2(:,3)+p;
```

```
for i=1:s(1),
```

```
    for j=1:s(2),
```

```
        for k=1:s(3),
```

```
            if im2(i,j,k) < 0;
```

```
                im2(i,j,k) = 0;
```

```
        end

        if im2(i,j,k) > 255;

            im2(i,j,k) = 255;

        end

    end

end

end

end

B=uint8(im2);


figure;

subplot(121)

imshow(im)

title('Original Image')

subplot(122)

imshow(B)

title('Periodic noise')

end
```

Output4:

