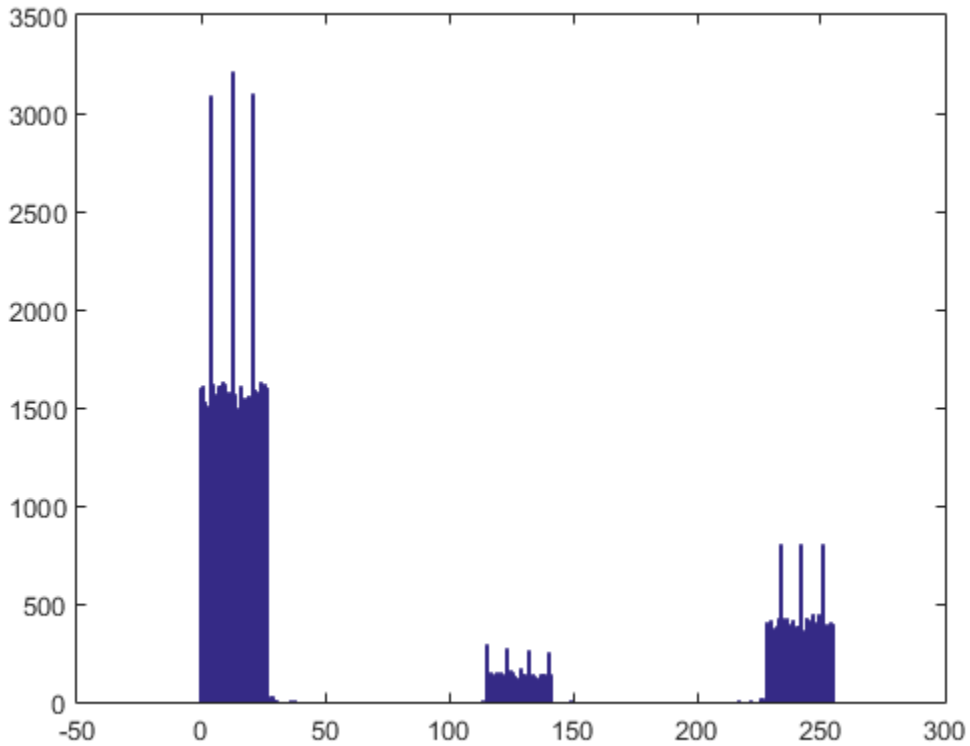
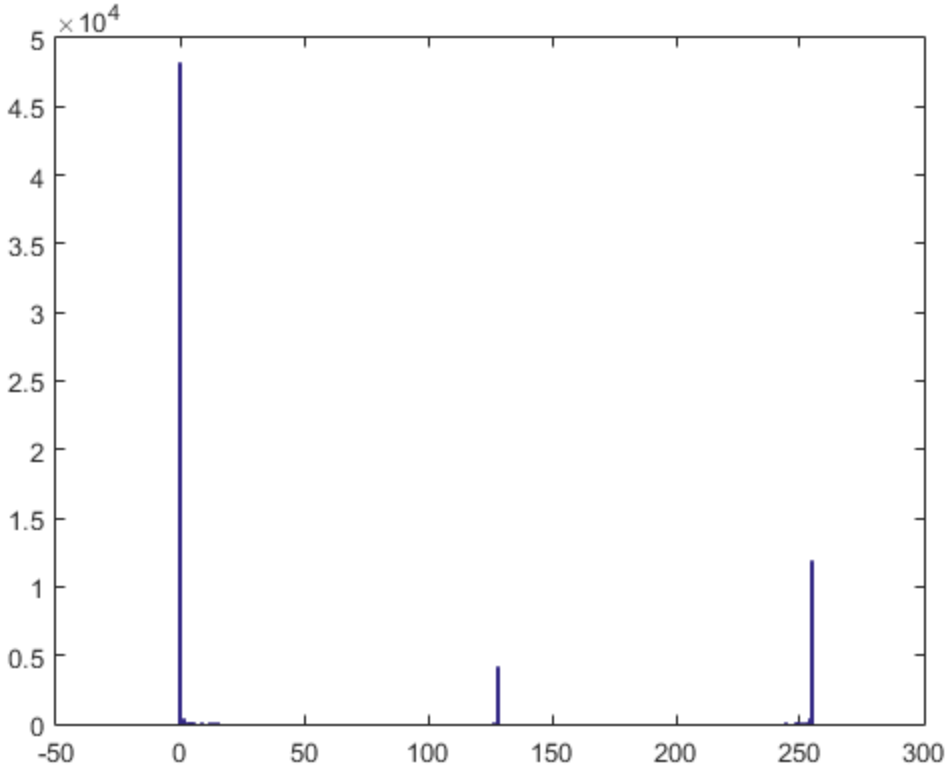
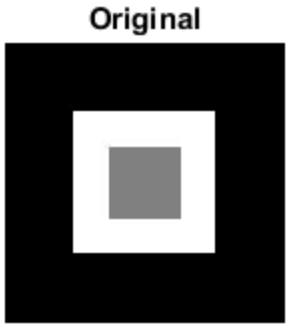
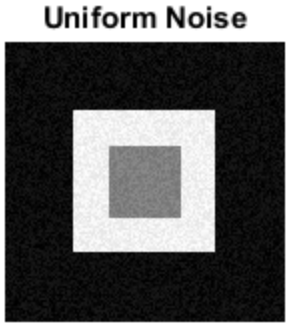
```
clear all;

a1=imread('Test_Image.jpg');
[m,n]=size(a1);

%generate uniform noise matrix
z=uint8(randi([10,40],m,n));

noisy_a=double(a1)+double(z);
noisy=imhist(mat2gray(noisy_a));
original=imhist((a1));

figure(1), bar(0:255,noisy)
figure(2), bar(0:255,original)
figure(3)
subplot(2,1,1)
imshow(a1,[]);
title('Original');
subplot(2,1,2)
imshow(noisy_a,[]);
title('Uniform Noise');
```









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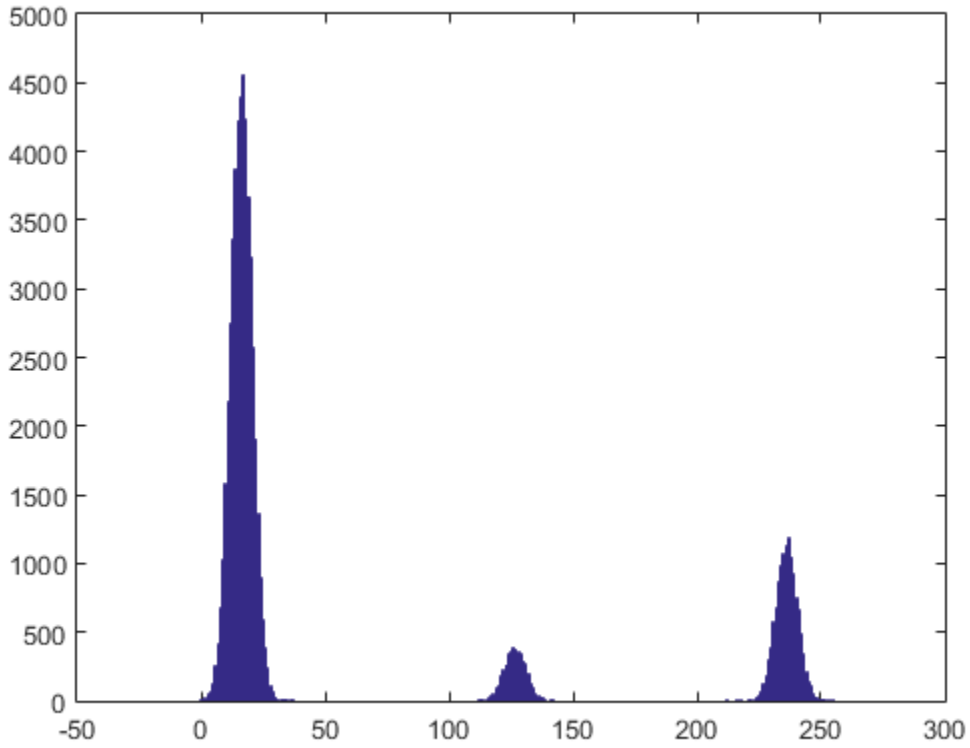
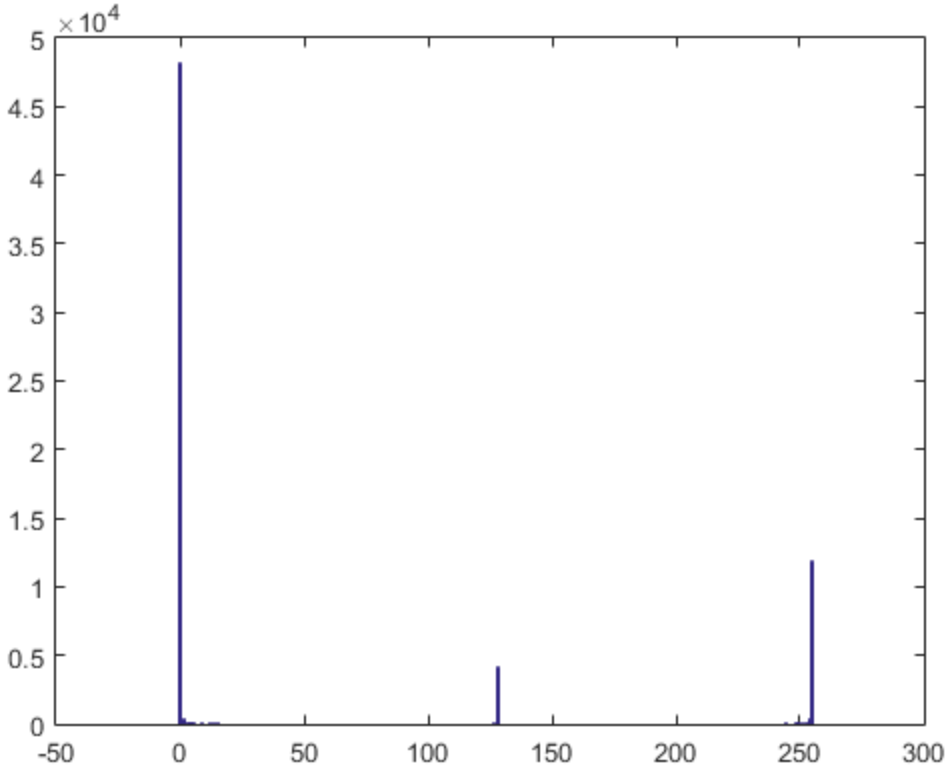
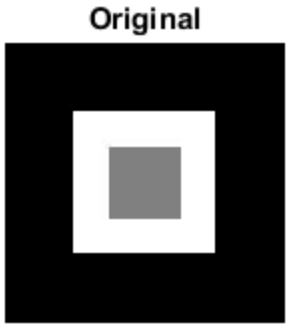
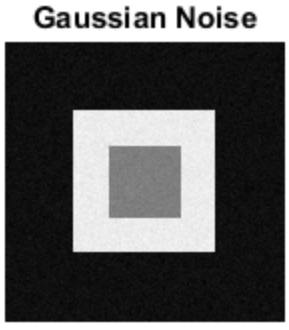
```
clear all;

a1=imread('Test_Image.jpg');
[m,n]=size(a1);

%generate gaussian noise
%1 is mean and 5 is standard deviation
z=1+5.*randn(m,n);

noisy_a=double(a1)+double(z);
noisy=imhist(mat2gray(noisy_a));
original=imhist((a1));

figure(1), bar(0:255,noisy)
figure(2), bar(0:255,original)
figure(3)
subplot(2,1,1)
imshow(a1,[]);
title('Original');
subplot(2,1,2)
imshow(noisy_a,[]);
title('Gaussian Noise');
```









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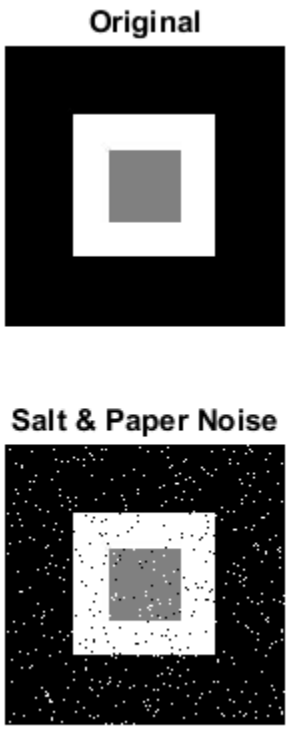
```
clear all;

a1=imread('Test_Image.jpg');
[m,n]=size(a1);

a1=double(a1);
a1=mat2gray(a1);
% figure(1), bar(0:255,imhist(a1));

%salt and paper noise
noisy=imnoise(a1,'salt & pepper',0.05);
% figure(2), bar(0:255,imhist(noisy));

subplot(2,1,1)
imshow(a1,[]);
title('Original');

subplot(2,1,2)
imshow(noisy,[]);
title('Salt & Paper Noise');
```



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Task 4

Implement order statistics filters : Max, Min and Median. Compare your results with inbuilt function 'ordfilt2'.

task4.m

```
clear all;

a1=imread('Test_Image.jpg');
[m,n]=size(a1);

a1=double(a1);
a1=mat2gray(a1);

subplot(5,2,1)
imshow(a1,[])
title('Original')

%salt and paper noise
noisy=imnoise(a1,'salt & pepper',0.05);

subplot(5,2,2)
imshow(noisy,[])
title('Noisy')

%Applying order statistic filters

%min filter
filter1=1/9 *(ones(3,3));
s=myfill(noisy,filter1);
subplot(5,2,3)
imshow(s,[]);
title('Using Min Filter')

%max filter
filter1=1/9 *(ones(3,3));
s=maxfil(noisy,filter1);
subplot(5,2,4)
imshow(s,[]);
title('Using Max Filter')

%median filter
filter1=1/9 *(ones(3,3));
s=medianfil(noisy,filter1);
```

```
subplot(5,2,5)
imshow(s,[]);
title('Using Median Filter')

%Using InBuilt function
figure(2)
B = ordfilt2(noisy,1,ones(3,3));
subplot(3,1,1)
imshow(B,[]);
title('using min filter');

B = ordfilt2(noisy,9,ones(3,3));
subplot(3,1,2)
imshow(B,[]);
title('using max filter');

B = ordfilt2(noisy,5,ones(3,3));
subplot(3,1,3)
imshow(B,[]);
title('using median filter');
```

myfil.m

```
function [ output ] = myfill( img,filter )

%size of img & filter
   [M,N]=size(img);
   [m,n]=size(filter);

   %make new matrix with padding
   a=(m-1)/2;
   b=a;
   new=zeros(M+2*a,N+2*b);
   new(a+1:a+M,1+b:N+b)=img;

   %size with padding
   [newM,newN]=size(new);

   for i=1:newM-m+1
      for j=1:newN-n+1
         k=new(i:i+m-1,j:j+n-1);
         output(i,j)=min(min(k*filter));
      end
   end
```

```
end
```

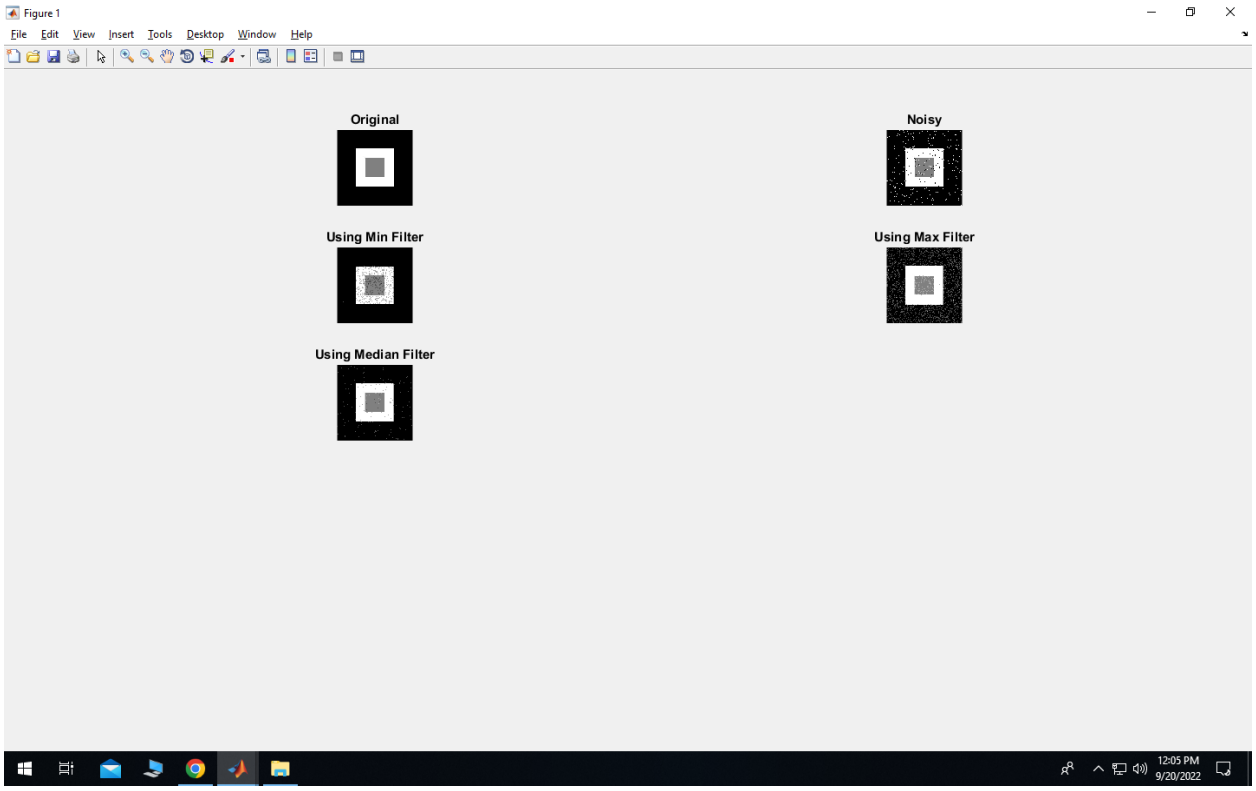
maxfil.m

```
function [ output ] = myfill( img,filter )

%size of img & filter
   [M,N]=size(img);
   [m,n]=size(filter);

   %make new matrix with padding
   a=(m-1)/2;
   b=a;
   new=zeros(M+2*a,N+2*b);
   new(a+1:a+M,1+b:N+b)=img;

   %size with padding
   [newM,newN]=size(new);

   for i=1:newM-m+1
      for j=1:newN-n+1
         k=new(i:i+m-1,j:j+n-1);
         output(i,j)=max(max(k*filter));
      end
   end

end
```

medianfil.m

```
function [ output ] = myfill( img,filter )

%size of img & filter
   [M,N]=size(img);
   [m,n]=size(filter);

   %make new matrix with padding
   a=(m-1)/2;
   b=a;
   new=zeros(M+2*a,N+2*b);
   new(a+1:a+M,1+b:N+b)=img;

   %size with padding
   [newM,newN]=size(new);
```

```
    for i=1:newM-m+1
        for j=1:newN-n+1
            k=new(i:i+m-1,j:j+n-1);
            output(i,j)=median(median(k*filter));
        end
    end

end
```



Using In Built Function

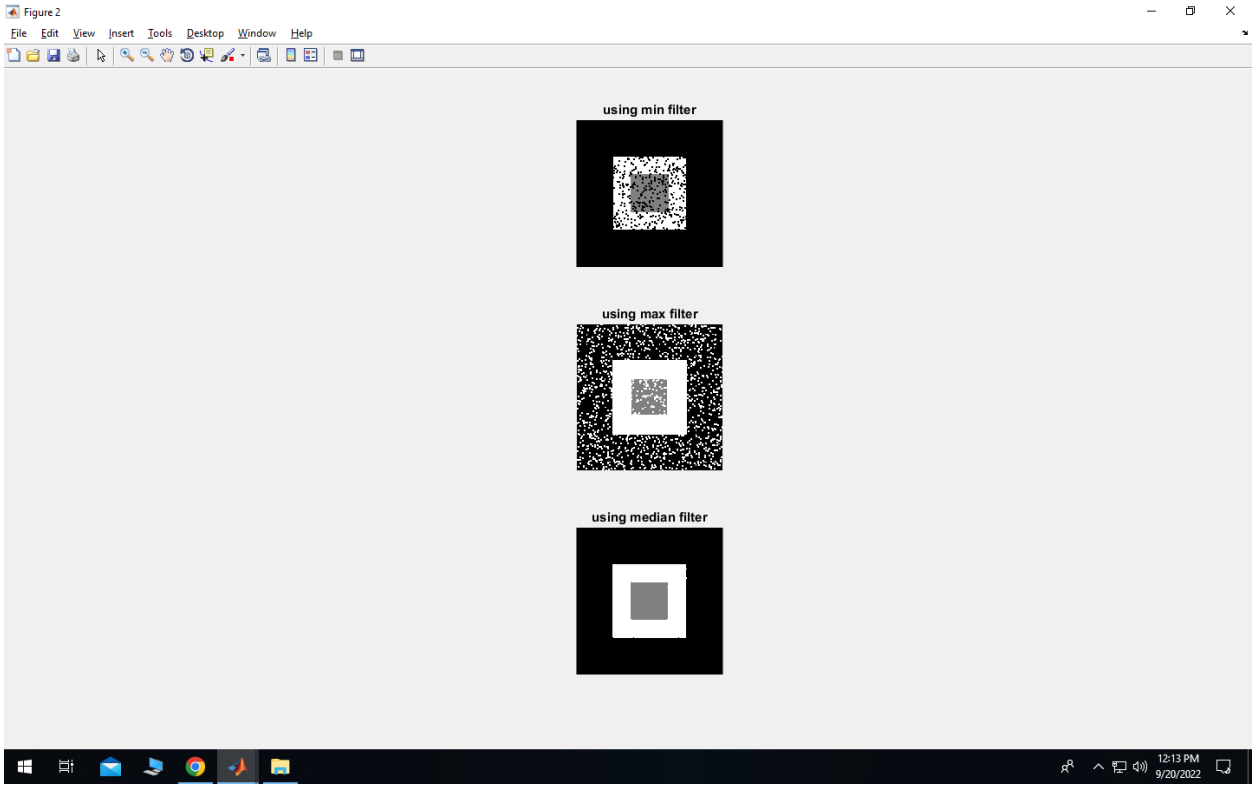


Figure 2
File Edit View Insert Tools Desktop Window Help
using min filter
using max filter
using median filter
12:13 PM
9/20/2022