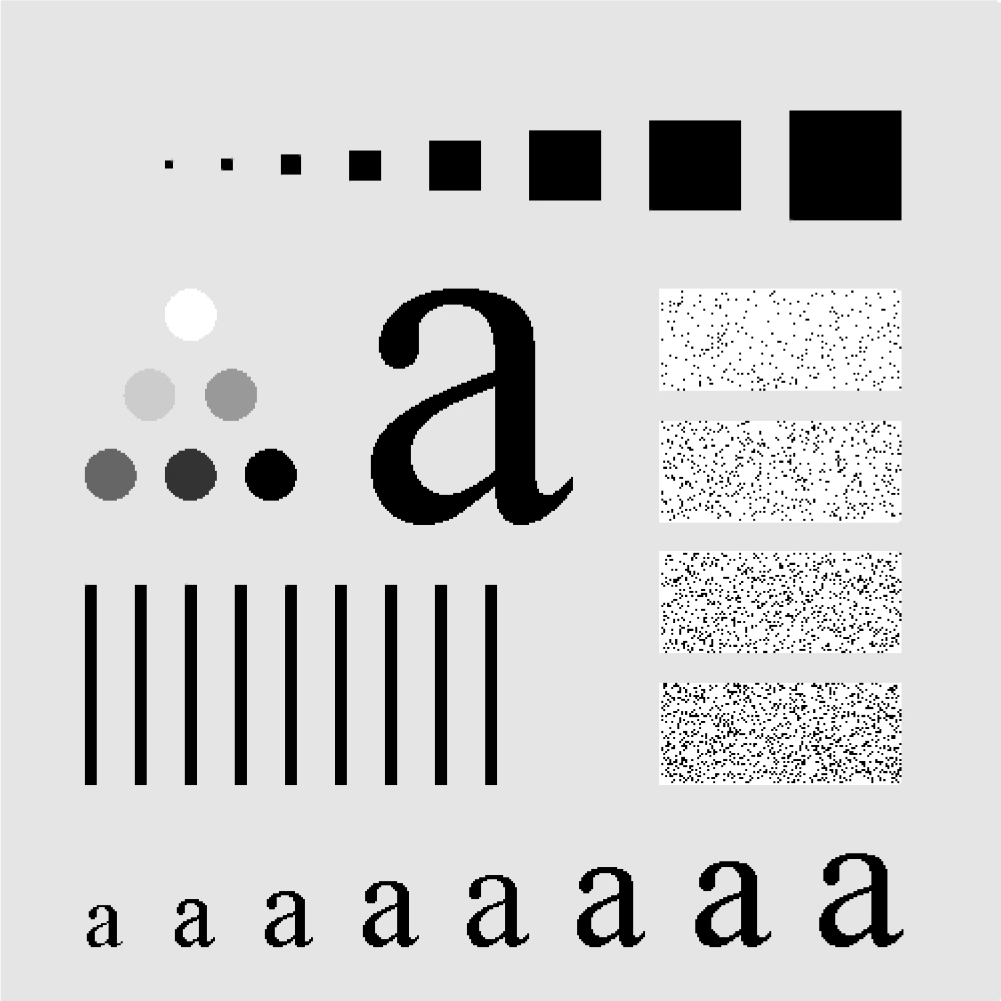
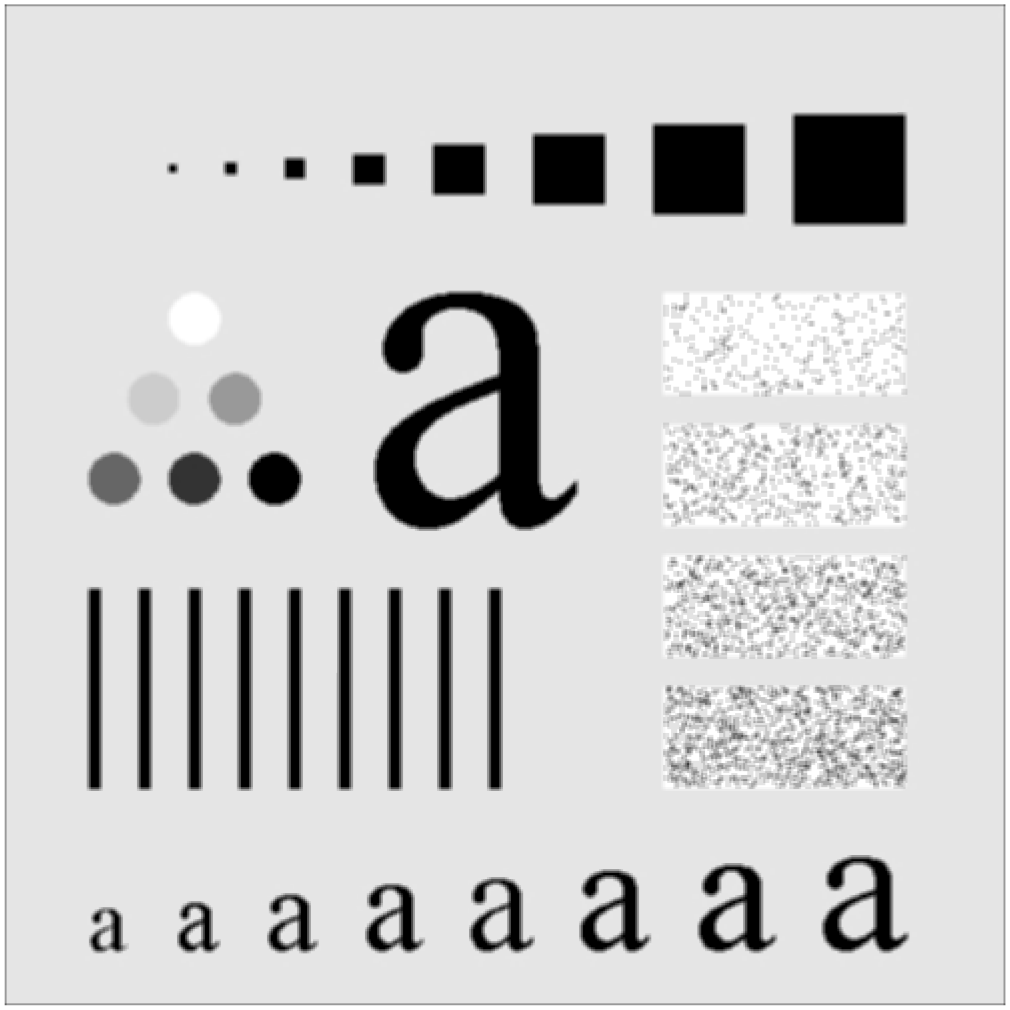
姓名：莊璧如 學號：111321534

ex1

```
im=imread('Fig3.35(a).jpg');
imshow(im,[])
```

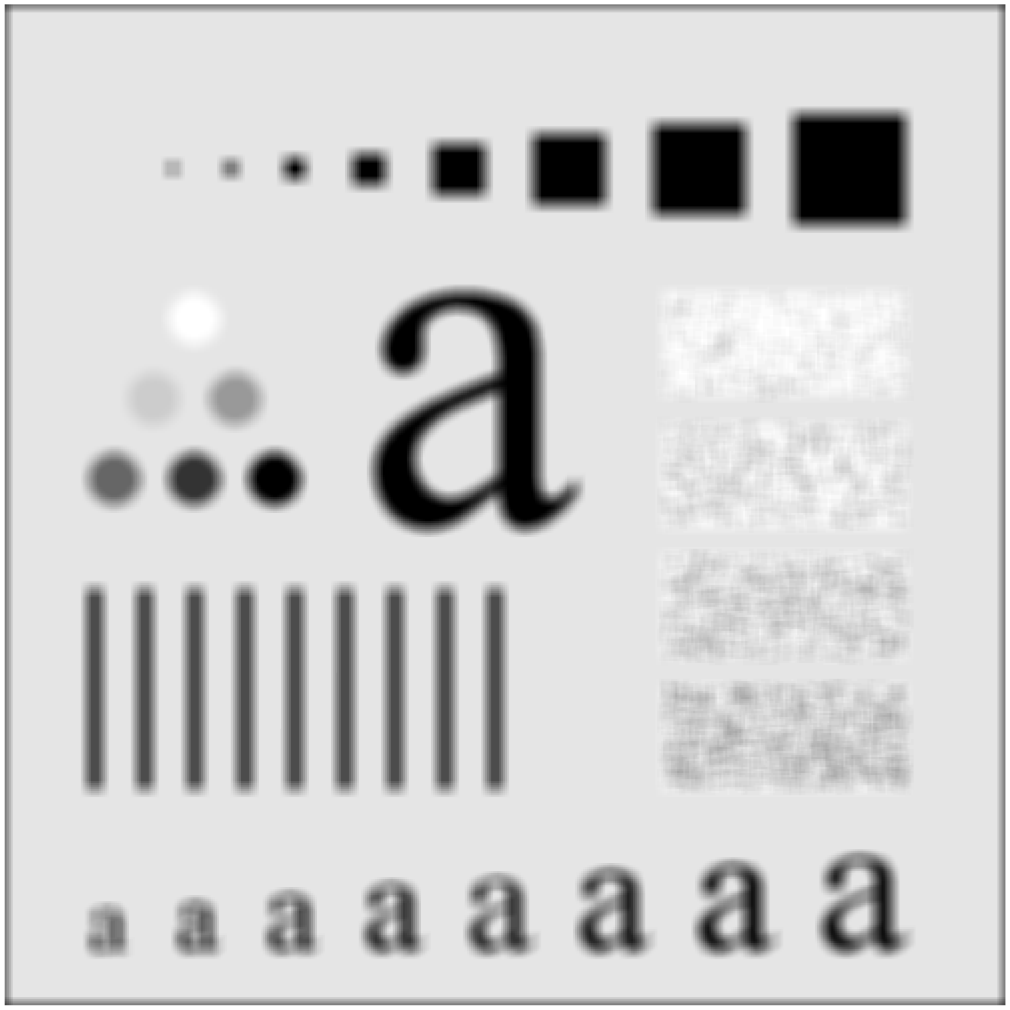


```
a=ones(3,3)/9;
i2=filter2(a,im,'same');
imshow(i2,[])
```

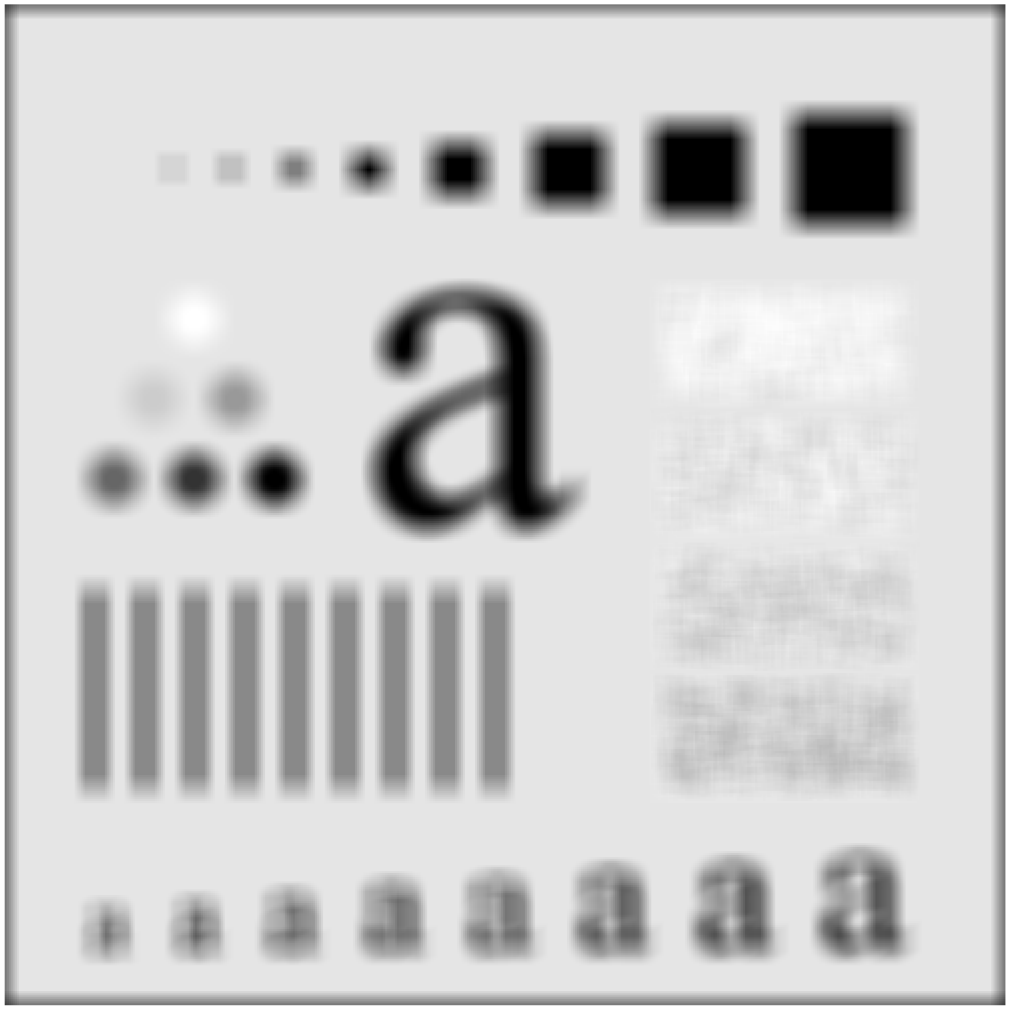


```
a=ones(5,5)/25;
i3=filter2(a,im,'same');
imshow(i3,[])
```

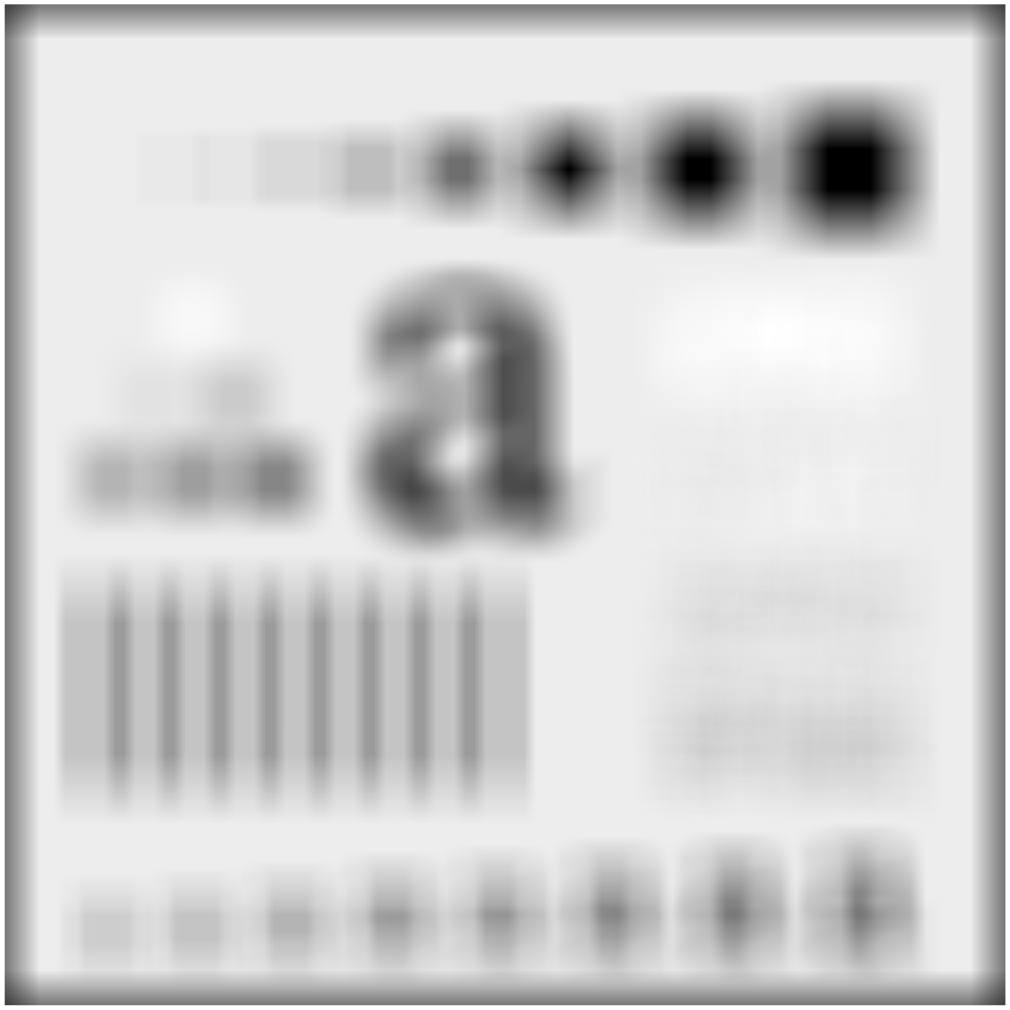
```
a=ones(9,9)/81;
i4=filter2(a,im,'same');
imshow(i4,[])
```



```
a=ones(15,15)/225;
i5=filter2(a,im,'same');
imshow(i5,[])
```



```
a=ones(35,35)/1225;
i6=filter2(a,im,'same');
imshow(i6,[])
```

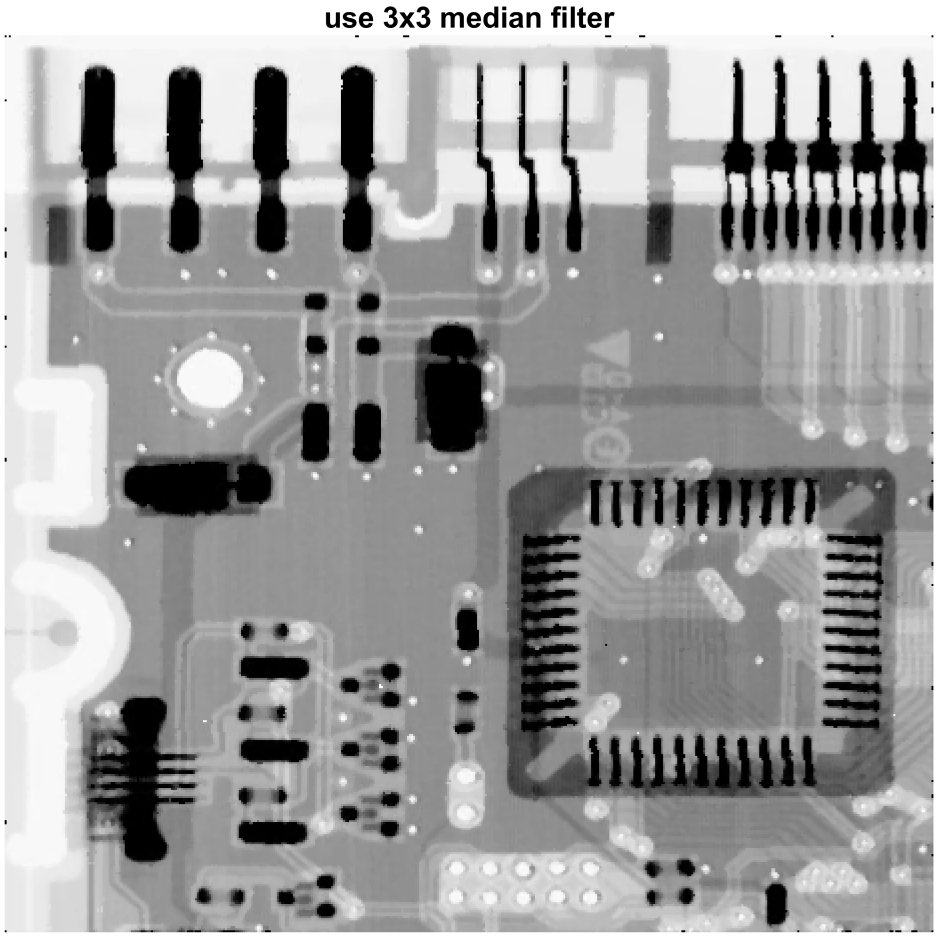


ex2

```
I=imread('ckt-board.tif');
J=imnoise(I, 'salt & pepper', 0.1);
J=medfilt2(J)
```

```
J = 448×464 uint8 matrix
     0   248     0   248   248   248   248   248   248   247   247   247   248 ···
   248   248   248   248   248   248   248   248   248   247   248   248   248
   248   248   248   248   248   248   248   247   247   247   248   248   248
   248   248   248   248   248   248   247   247   247   248   249   249   250
   248   248   248   248   248   247   247   247   248   249   249   249   250
   248   248   248   248   248   248   248   249   249   249   246   243   241
   248   248   248   248   248   248   249   250   250   246   239   233   224
   248   248   248   248   248   248   249   250   248   243   233   224   215
   248   248   248   248   248   248   248   248   247   242   233   222   215
   248   248   248   248   248   248   248   248   247   242   233   222   215
     ⋮
```

```
figure, imshow(J)
title('use 3x3 median filter')
```

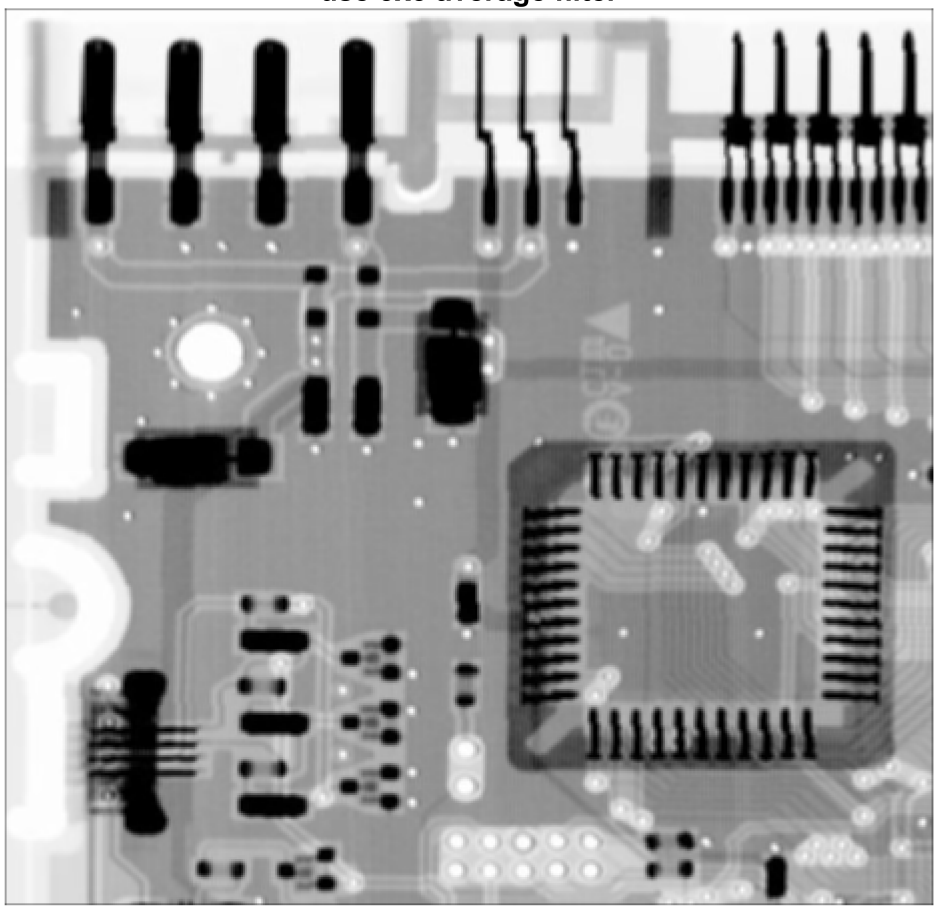



```
a=ones(3,3)/9;
J2=filter2(a,I,'same')
```

```
J2 = 448×464
  110.2222  165.3333  165.3333  165.3333  165.3333  165.3333  165.3333  165.2222 ···
  165.3333  248.0000  248.0000  248.0000  248.0000  248.0000  247.8889  247.6667
  165.3333  248.0000  248.0000  248.0000  247.8889  247.7778  247.5556  247.3333
  165.3333  248.0000  248.0000  248.0000  247.6667  247.4444  247.2222  247.4444
  165.3333  248.0000  248.0000  248.0000  247.4444  247.1111  247.1111  247.8889
  165.3333  248.0000  248.0000  248.0000  247.4444  247.3333  247.6667  248.7778
  165.3333  248.0000  248.0000  248.0000  247.7778  248.0000  248.6667  249.4444
  165.3333  248.0000  248.0000  248.0000  248.0000  248.3333  248.8889  249.1111
  165.3333  248.0000  248.0000  248.0000  248.1111  248.3333  248.6667  248.4444
  165.3333  248.0000  248.0000  248.0000  248.0000  248.0000  248.0000  247.6667
     ⋮
```

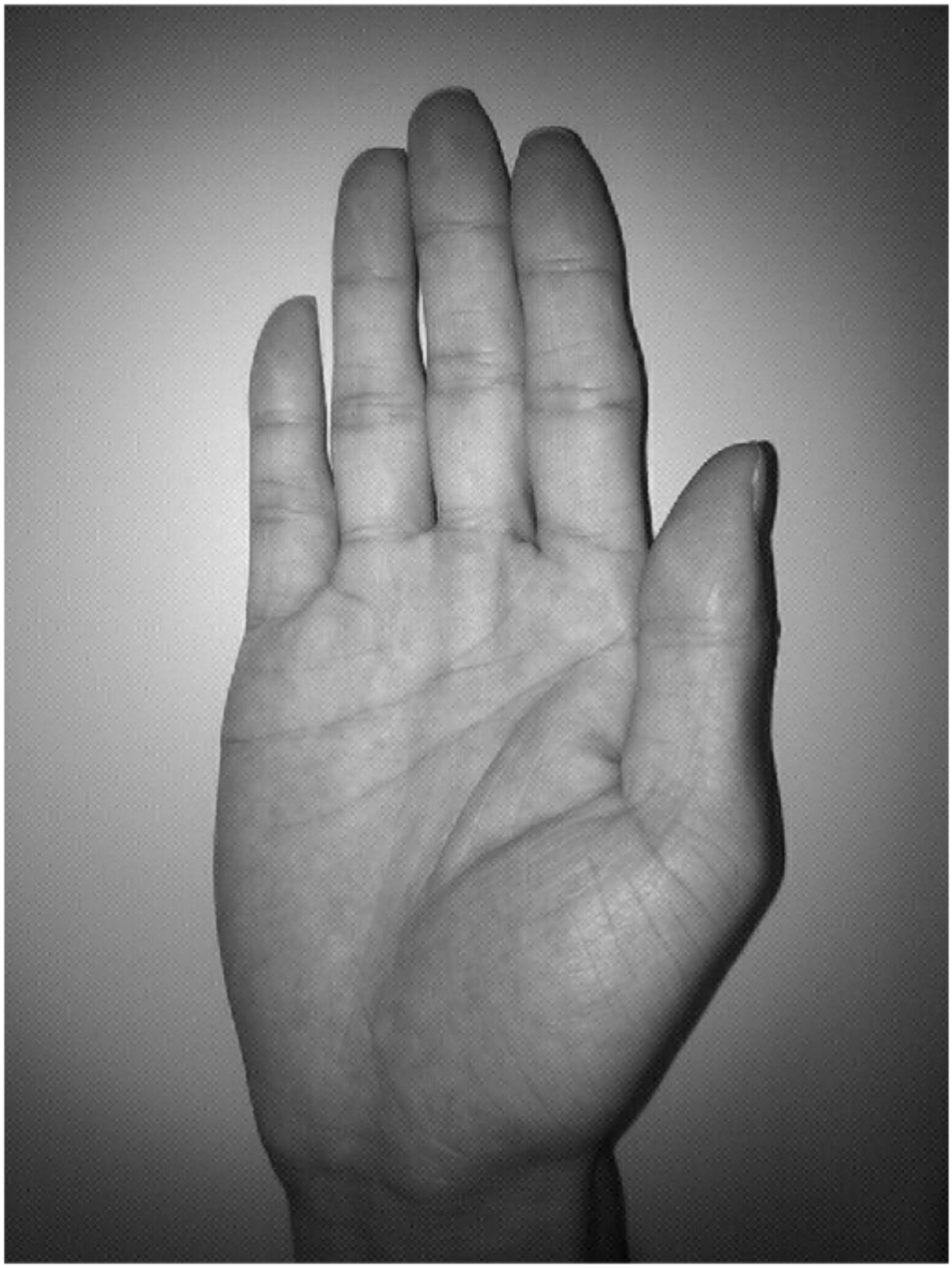
```
imshow(J2,[])
title('use 3x3 average filter')
```

use 3x3 average filter



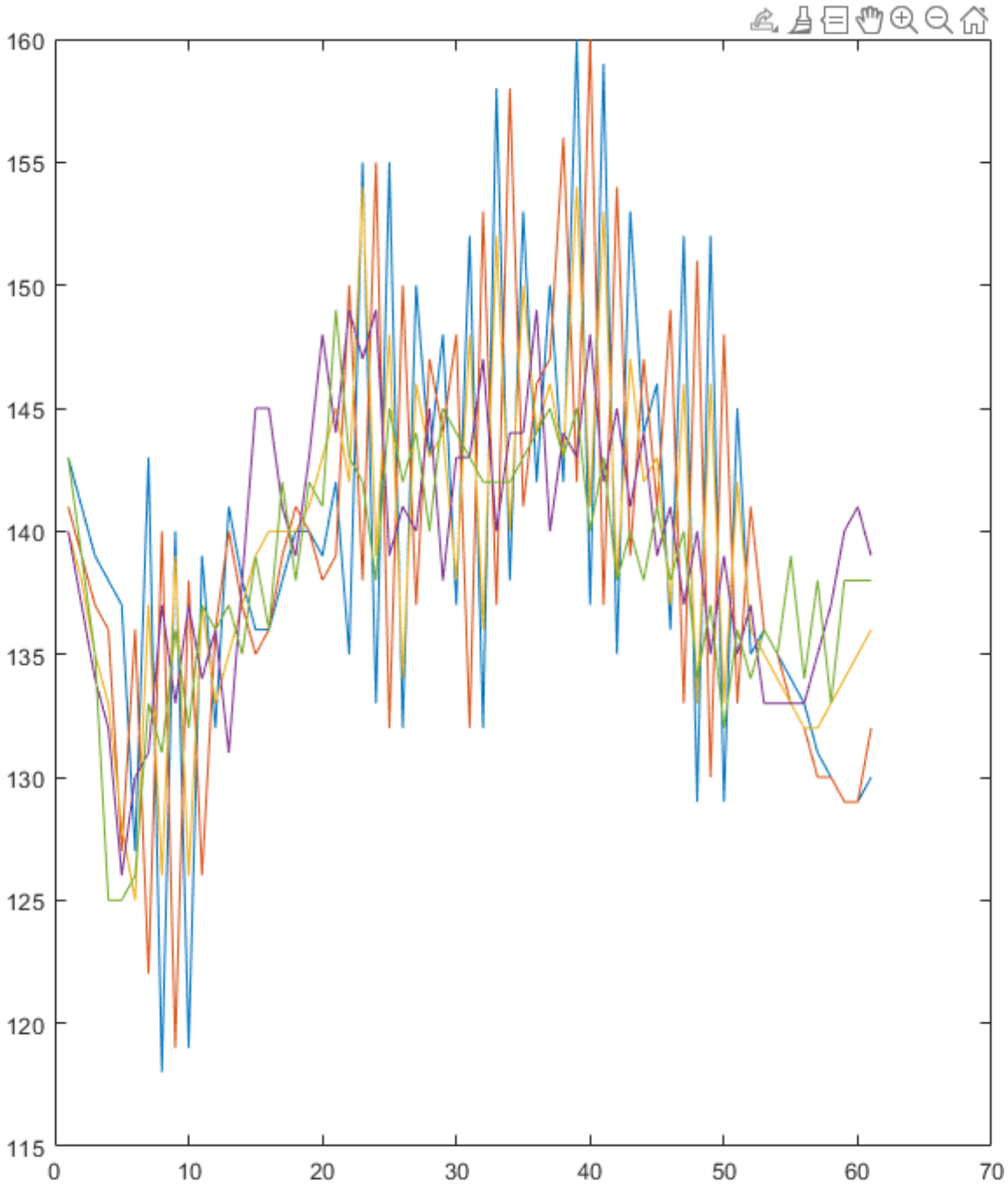
ex3

```
palm=imread('palm2016.jpg');
imshow(palm,[])
[x,y]=getline()
```



```
x = 3×1
  332.7500
  337.2500
  337.2500
y = 3×1
  613.0000
  673.0000
  674.5000
```

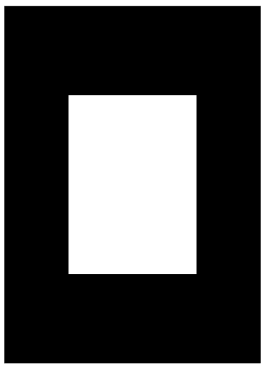
```
plot(palm(uint16(y(1)):uint16(y(2)),uint16(x(1)):uint16(x(2))))
```



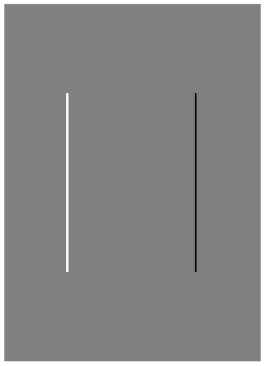
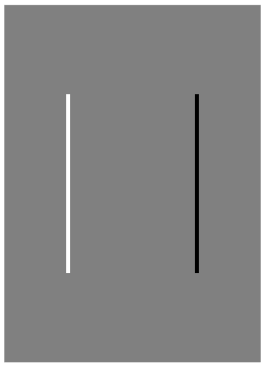
ex4

```
A=zeros(128,128);
A(33:96,33:96)=255*ones(64,64);
```

```
imshow(A,[])
```



```
h=[-1,1];
a1=filter2(h,A,'same');
imshow(a1,[])
```



```
h=[-1,0,1];
out=filter2(h,A,'same');
imshow(out,[])
```