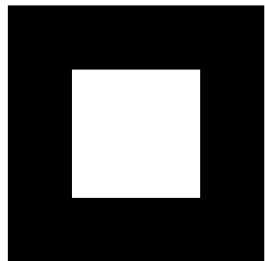


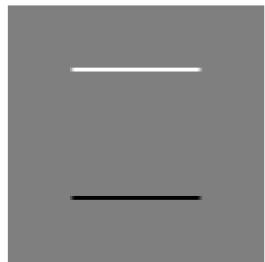
姓名 : 莊璧如 學號 : 111321534

ex1

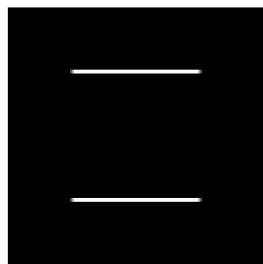
```
A=zeros(128,128);  
A(33:96,33:96)=255*ones(64,64);  
imshow(A,[])
```



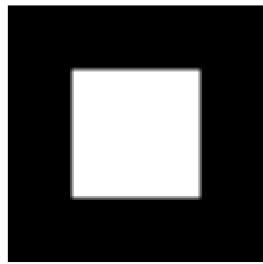
```
t=[-1 -1 -1;0 0 0;1 1 1];  
ay=filter2(t,A,'same');  
imshow(ay,[])
```



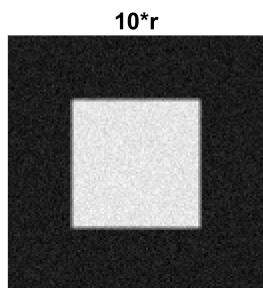
```
imshow(abs(ay),[])
```



```
a=ones(3,3)/9;
a2=filter2(a,A, 'same');
imshow(a2,[])
```

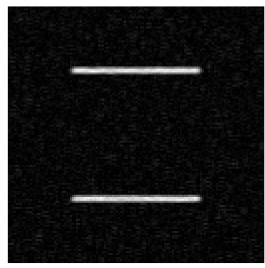


```
r=randn(size(a2));
imshow(a2+10*r,[])
title('10*r')
```

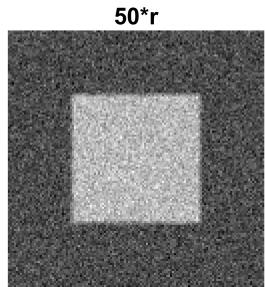


```
a3=filter2(t,a2+10*r, 'same');
```

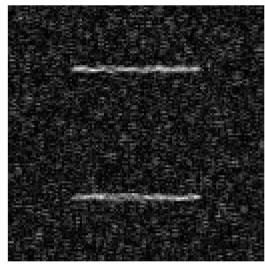
```
imshow(abs(a3),[])
title(a3)
```



```
imshow(a2+50*r,[])
title('50*r')
```

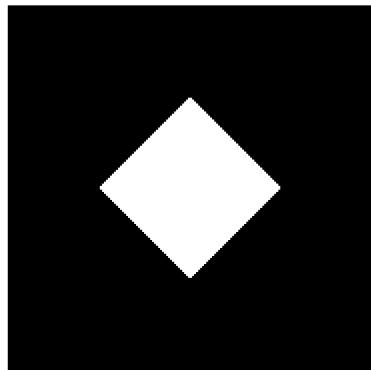


```
a4=filter2(t,a2+50*r,'same');
imshow(abs(a4),[])
title(a4)
```

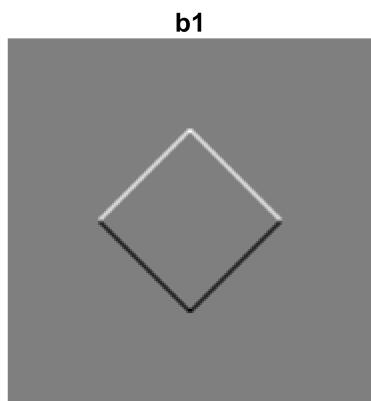


ex2

```
A=zeros(128,128);
A(33:96,33:96)=255*ones(64,64);
B= imrotate(A, 45);
imshow(B,[])
```

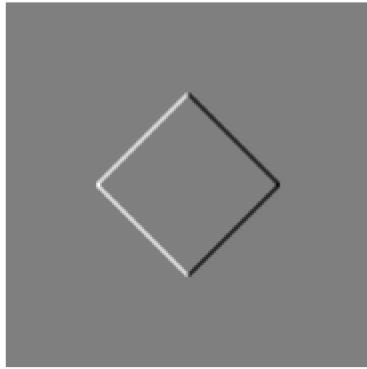


```
t=[-1 -1 -1;0 0 0;1 1 1];
b1=filter2(t,B, 'same');
imshow(b1,[])
title('b1')
```



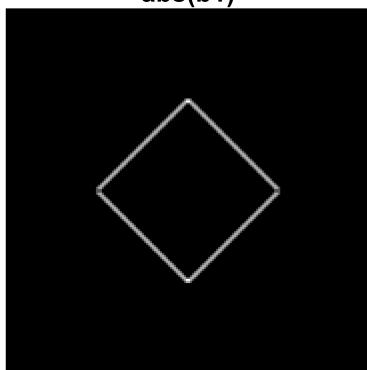
```
t2=[-1 0 1;-1 0 1;-1 0 1];
b2=filter2(t2,B, 'same');
imshow(b2,[]);
title('b2')
```

b2



```
imshow(abs(b1),[])
title('abs(b1)')
```

abs(b1)



ex3

```
house=imread('house.jpg');
imshow(house,[])
```



```
t3=[-1 -2 -1;0 0 0;1 2 1];
house2=filter2(t3,house, 'same');
imshow(abs(house2),[]);
title('house2-horizon')
```

house2-horizon

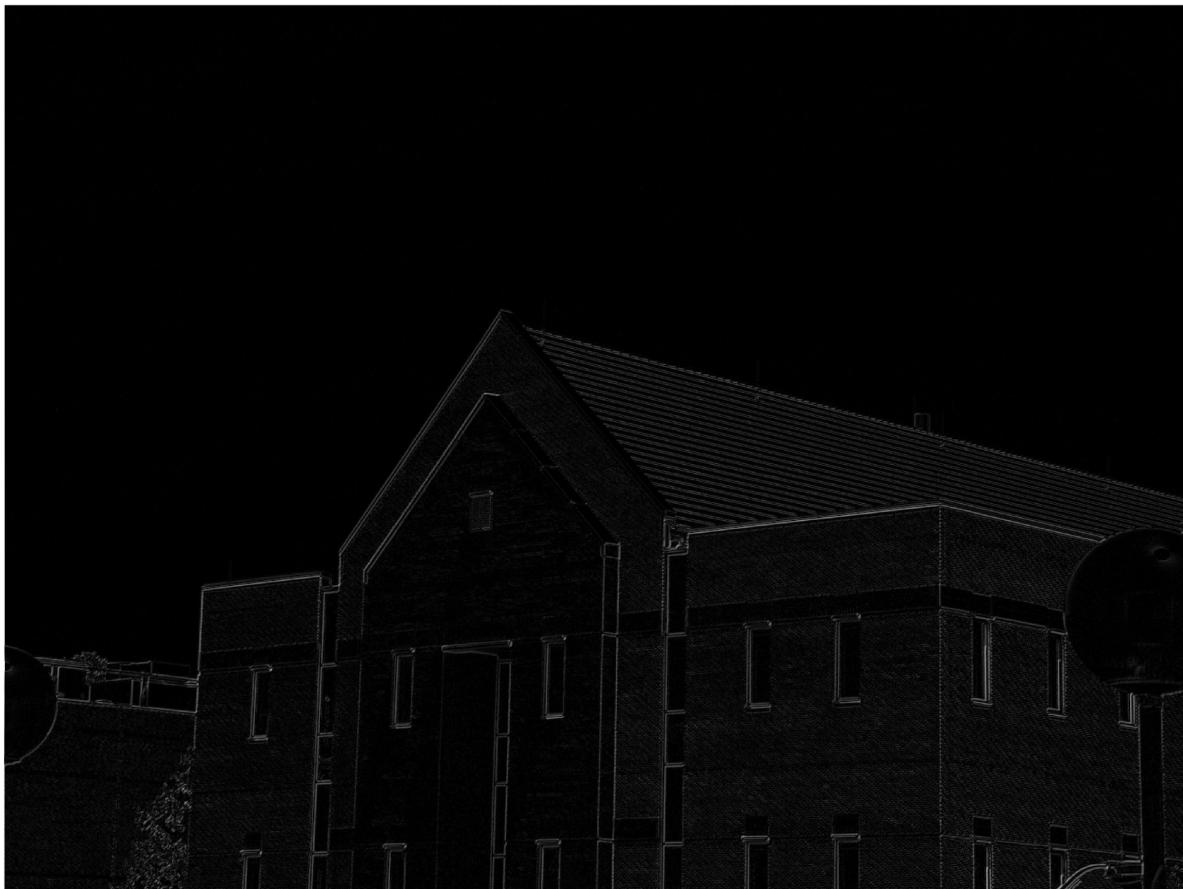


```
t4=[-1 0 1;-2 0 2;-1 0 1];
house3=filter2(t4,house, 'same');
imshow(abs(house3),[])
```



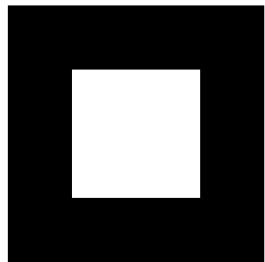
```
imshow(abs(house2+house3),[])
title('house2+house3')
```

house2+house3



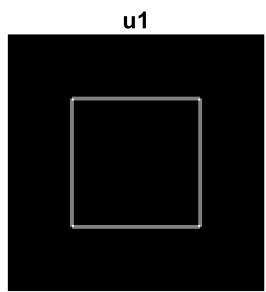
ex4

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

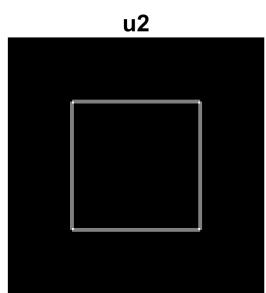


```
t5=[0 -1 0;-1 4 -1;0 -1 0];
u1=filter2(t5,A, 'same');
```

```
imshow(abs(u1),[]);  
title('u1')
```



```
t6=[-1 -1 -1;-1 8 -1;-1 -1 -1];  
u2=filter2(t5,A, 'same');  
imshow(abs(u2),[]);  
title('u2')
```



ex5

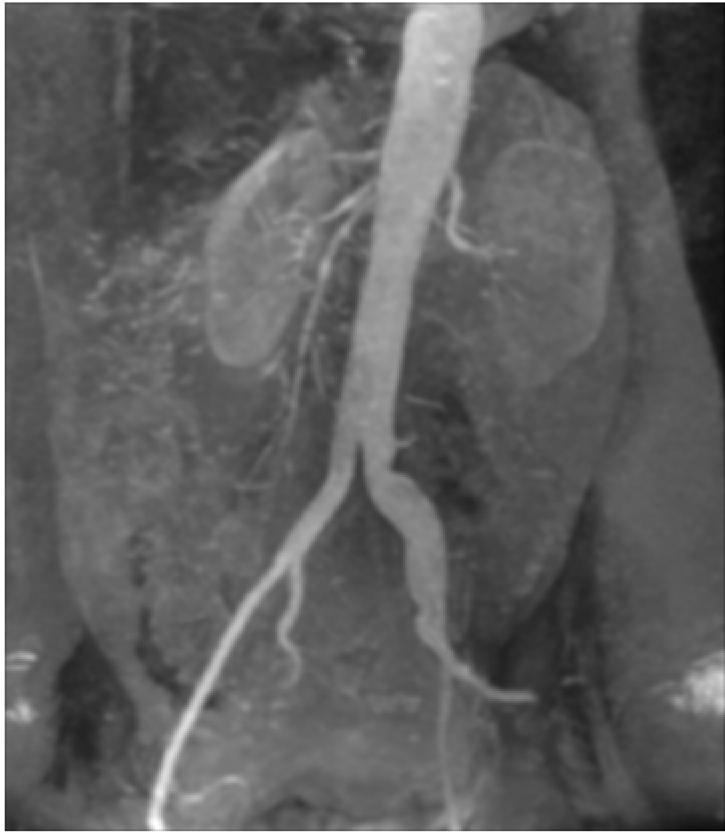
```
heart=imread('heart (1).jpg');  
imshow(heart,[])  
title('heart')
```

heart



```
g=fspecial('gaussian');
heart1=filter2(g,heart,'same');
imshow(heart1,[])
title('heart1')
```

heart1



```
t7=[-1 -1 -1;-1 8 -1;-1 -1 -1];
heart2=filter2(t7,heart, 'valid')
```

```
heart2 = 412x358
 4      6      3      3      5      1      2      5      -2      2      -1      4      -8 ...
 -6     -3      4      7     -3      1     -3     15     16      6     -1     -2     -4
 -3    -13     -9      1     -2     -1      1     17     10      9     -5     -9     -4
 -8    -11     -5     -9     -8      3      7      6      9     -5      2     -11     -4
 -3      1      1     -5    -14    -15     -4     -1      3     -8     -1     -6     10
 6      9     11      2      0     -3     -5     -7     -3     -7     -6      2      6
 2      6     10      3     -7      0      1      2     -2     -6     -6     -5      2
 2     17      3     -6     -1     -5      3      5      1     -2     -2     -7     -3
 -1     -3      0     -5     -4     -2     -3      7     -7     -3     -4      1     -3
 1     -2      7     -4      2      3      3      4      6     -3      2      6      1
 :
 :
```

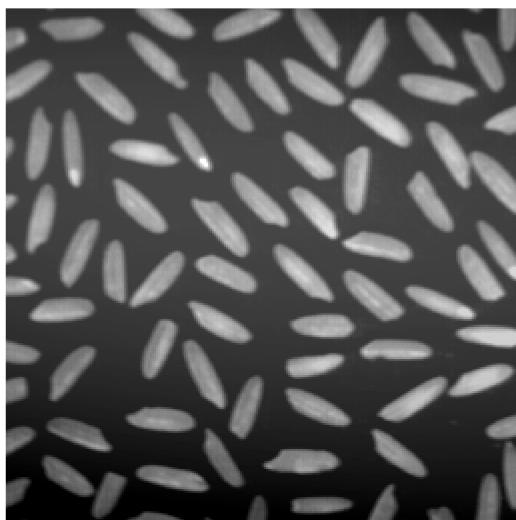
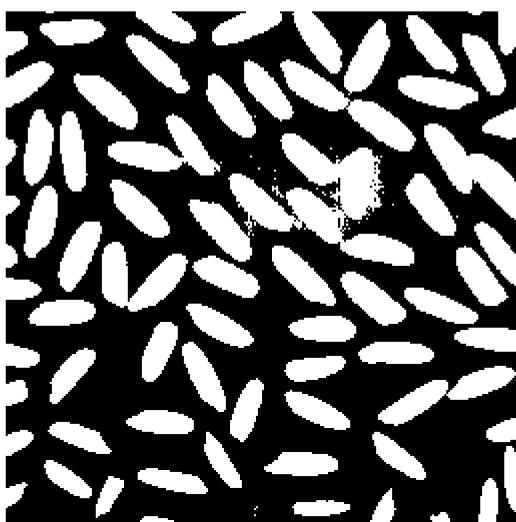
```
imshow(heart2,[])
title('heart2');
```

heart2

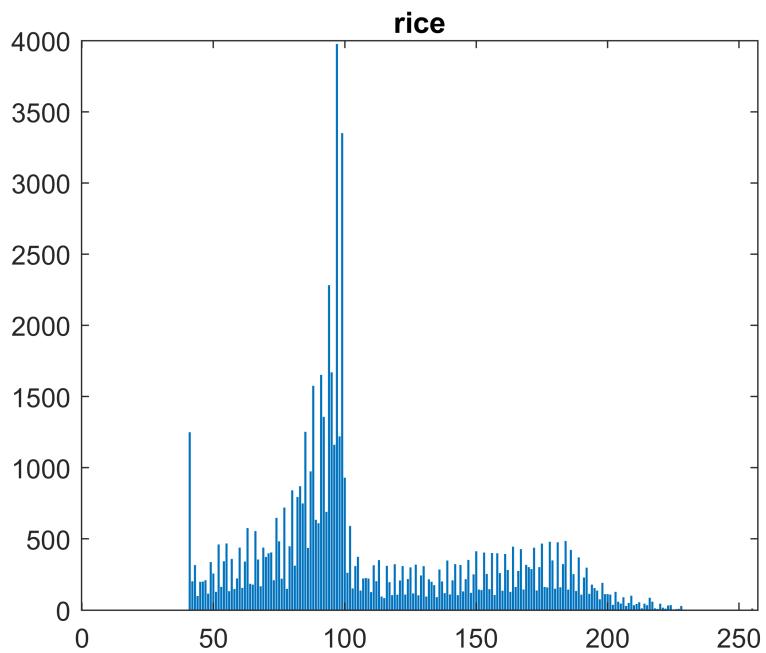


ex6

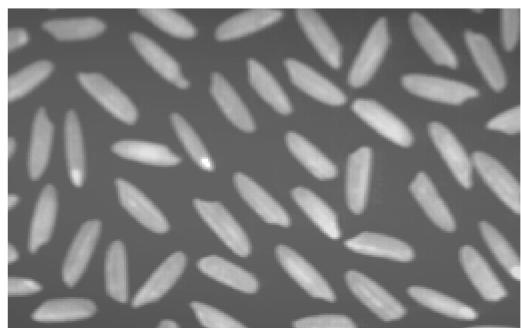
```
rice=imread('rice.tif');
imshow(rice,[])
figure, imshow(b>100)
```



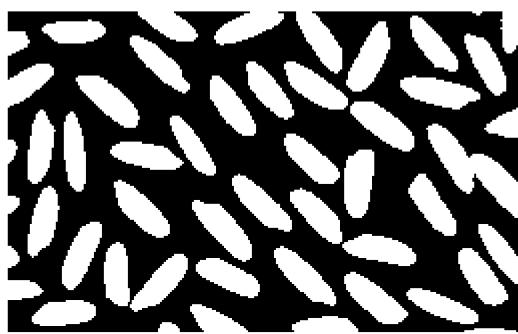
```
ret=myhist(rice);
bar(ret);
title('rice')
```



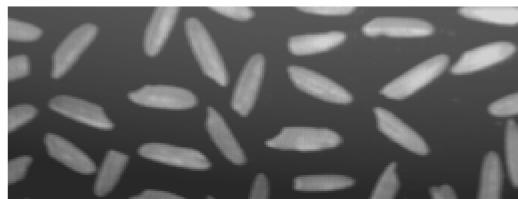
```
iu=rice(1:160,:);  
imshow(iu)
```



```
iut=iu>110;  
imshow(iut)
```



```
id=rice(161:256,:);  
imshow(id)
```



```
idt=id>90;  
imshow(idt)
```



```
it=[iut;idt];  
imshow(it)
```



```
function ret=myhist(I)
    ret = zeros(256,1); % initialize histogram vector
    [row, col]=size(I);
    for i=1:row

        for j=1:col
            ret(I(i,j)+1)=ret(I(i,j)+1)+1;
        end
    end
end
```