
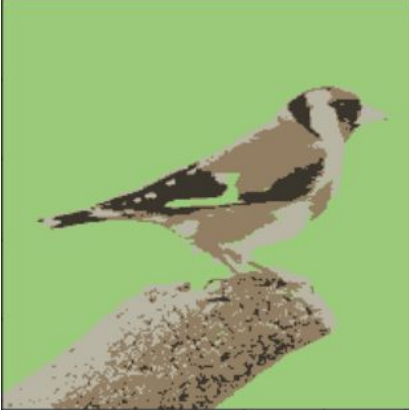





# Homework #1

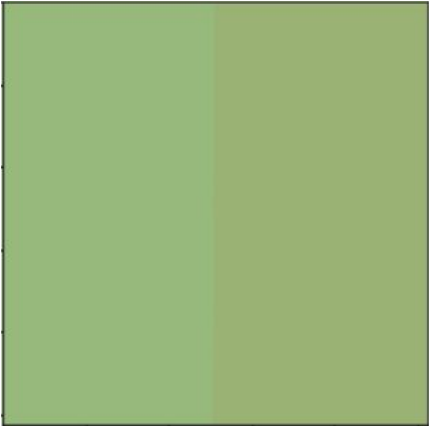
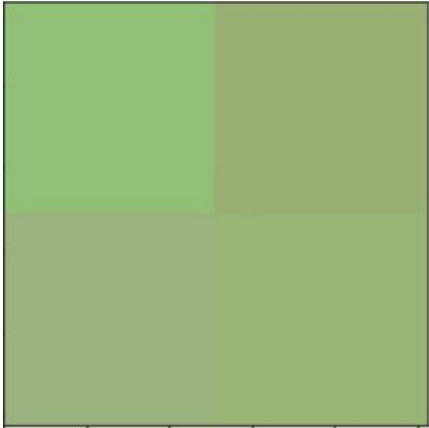
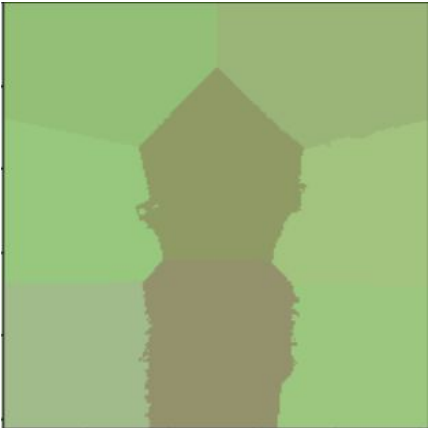


資工所碩二 R08922122 林念澤

Collaborator : R08922111 丁立安

1-1.

k = 2	k = 4
	
k = 8	k = 16
	
k = 32	
	






1-2.

$k = 2$	$k = 4$
	
$k = 8$	$k = 16$
	
$k = 32$	
	

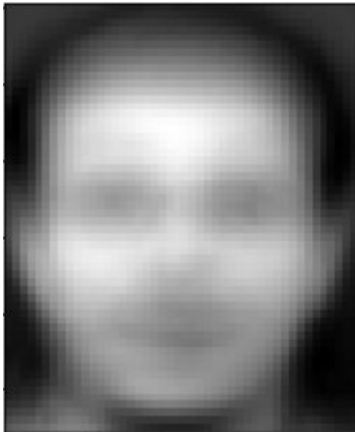


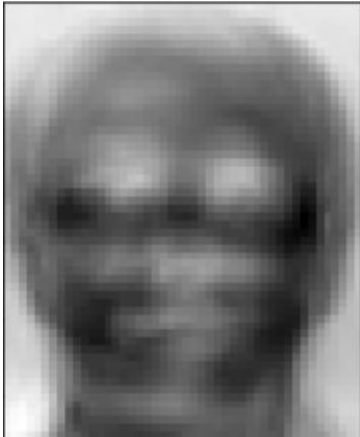
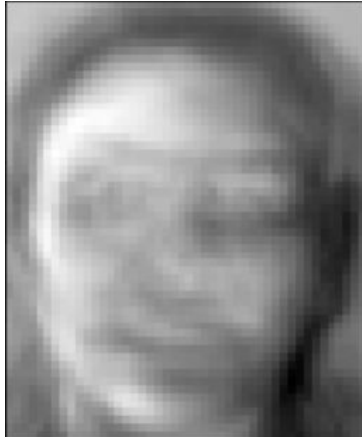
1-3.

由於x, y座標的值(0~1023)遠大於pixel intensity(0~255), 因此在2中距離(歐幾里得距離)相近的點有較高機率被分在同一群, pixel intensity對於結果幾乎沒有影響






一個可能的方式是將x, y座標值壓縮到0~127之間(pixel intensity的一半), 結果如下, 當k=32時, 結果與1-1相當 :

k = 2	k = 4
	
k = 8	k = 16
	
k = 32	
	

2-1.

Mean face	
	
Eigen face #1	Eigen face #2
	
Eigen face #3	Eigen face #4
	

2-2. & 2-3.

n = 3	n = 50
	
MSE = 13896.5981	MSE = 13854.6509
n = 170	n = 240
	
MSE = 13657.7835	MSE = 13628.5067
n = 345	
	
MSE = 13613.9059	

2-4.

k = 1, n = 3			k = 1, n = 50			k = 1, n = 170		
0.708	0.63	0.61	0.96	0.96	0.97	0.96	0.96	0.95
avg : 0.650			avg : 0.961			avg : 0.956		
k = 3, n = 3			k = 3, n = 50			k = 3, n = 170		
0.63	0.62	0.58	0.87	0.93	0.91	0.87	0.91	0.89
avg : 0.611			avg : 0.9			avg : 0.889		
k = 5, n = 3			k = 5, n = 50			k = 5, n = 170		
0.56	0.62	0.51	0.83	0.87	0.85	0.8	0.82	0.85
avg : 0.56			avg : 0.847			avg : 0.822		

選擇(k=1, n=50)

2-5.

recognition rate of testing test = 0.925

3-1.

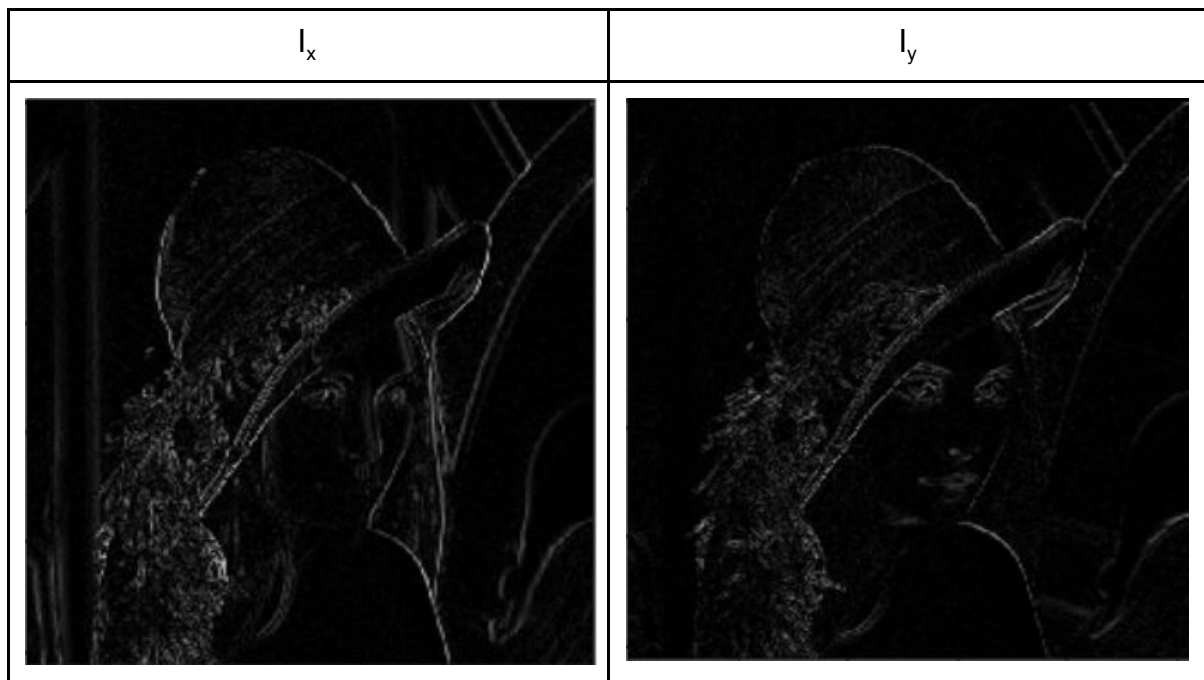


Gaussian filter具有模糊化的效果且愈大的filter效果愈強

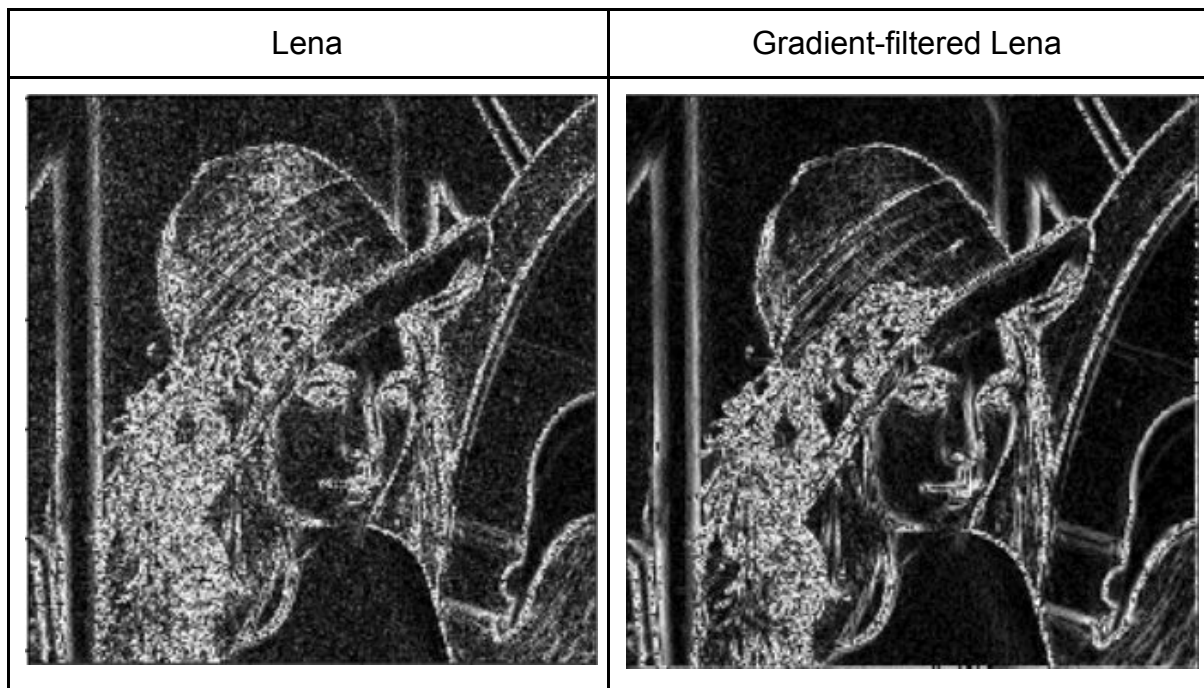
3-2.

$$k_x = [[-1, 0, 1]] * (1/2)$$

$$k_y = [[-1], [0], [1]] * (1/2)$$



3-3.



經過Gaussian-filtered模糊化的影像，會減少pixel intensity的變化，因此會減少非edge的雜訊