影像處理專題

第2次練習報告

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Image Processing Project **Tien-Ying Kuo@NTUT**
00 MATLAB Exercise:

Exercise Loop & Condition

Exercise 11

給一任意向量 x 或陣列，請以下列各種 x 作測試

x=[1 1 0 0 1 1], x=[0 0 0], x=[-1 3 4 5], x=zeros(3), x=eye(4), x=ones(3,2)

(1) zeros(), ones(), eye()函數功用為何？

(2) 使用 for 迴圈與 if 指令，判斷是否含有非 0 元素。

(3) 使用 for 迴圈與 if 指令，判斷是否全部為非 0 元素

(4) 不用迴圈, 以一行指令完成(2)

(5) 不用迴圈, 以一行指令完成(3)

Hint for (4)&(5): any(), all()

(1)

Discussion	
zeros() 製造全 0 矩陣 ones() 製造全 1 矩陣 eye() 製造主對稱線元素為 1，其餘為 0 矩陣	
Ans	**Code**
x1 = 1 1 0 0 1 1 X2 = 0 0 0 X3 = -1 3 4 5 X4 = 0 0 0 0 0 0 0 0 0 X5 = 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 X6 = 1 1 1 1 1 1	x1=[1 1 0 0 1 1], x2=[0 0 0], x3=[-1 3 4 5], x4=zeros(3), x5=eye(4), x6=ones(3,2)

(2)

Discussion	
Ans	Code

Matric has none zero element
Matric has only zero element
Matric has none zero element
Matric has only zero element
Matric has none zero element
Matric has none zero element
	function all_zero_check(x)
	zf = 1;
	for i = x(:)',
	  if i ~= 0,
	  zf = 0;
	  end
	end
	
	if zf == 0,
	  fprintf('Matric has none zero element\n');
	else
	  fprintf('Matric has only zero element\n');
	end
	
	all_zero_check(x1)
	all_zero_check(x2)
	all_zero_check(x3)
	all_zero_check(x4)
	all_zero_check(x5)
	all_zero_check(x6)

(3)

Discussion	
Ans	Code

Matric has zero element
Matric has zero element
Matric has only none zero element
Matric has zero element
Matric has zero element
Matric has only none zero
	function all_none_zero_check(x)
	  nzf = 1;
	  for i = x(:)',
	  if i == 0,
	  nzf = 0;
	  end
	  end

element	if nzf == 0, fprintf('Matric has zero element\n'); else fprintf('Matric has only none zero element\n'); end all_none_zero_check(x1) all_none_zero_check(x2) all_none_zero_check(x3) all_none_zero_check(x4) all_none_zero_check(x5) all_none_zero_check(x6)

(4)

Discussion	
Ans	Code
ans = 1	any(x1(:))
ans = 0	any(x2(:))
ans = 1	any(x3(:))
ans = 0	any(x4(:))
ans = 1	any(x5(:))
ans = 1	any(x6(:))

(5)

Discussion	
Ans	Code
ans = 0	all(x1(:))
ans = 0	all(x2(:))
ans = 1	all(x3(:))
ans = 0	all(x4(:))
ans = 0	all(x5(:))
ans = 1	all(x6(:))

Exercise 15

計算 k=$\sum_{n=1}^{100} n$, 如果 k>3841, 則輸出最早滿足條件的 n

(1) 使用 for 迴圈

(2) 使用 while 迴圈

(3) 不用迴圈, 以一行程式求出 n

Hint for (3): cumsum(), find()

(1)

Discussion	
Ans	Code

88	k = 0;
	for n = (1:100),
	  k = k + n;
	  if k > 3841,
	  break
	  end
	end
	
	fprintf('%d', n)

(2)

Discussion	
Ans	Code

88	k = 0;
	n = 0;
	while k <= 3841,
	  n = n + 1;
	  k = k + n;
	
	end
	fprintf('%d', n);

(3)

Discussion	
Ans	Code
ans = 88	min(find(cumsum(1:100) > 3841))

Exercise Function

Exercise 20

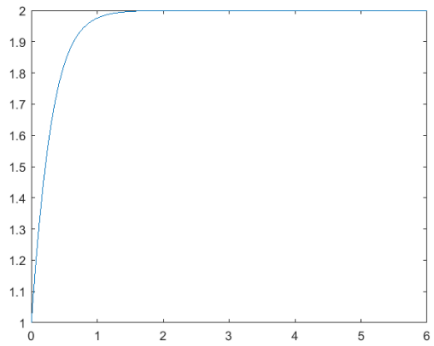
將以下 2 函數畫入同一個圖中，不同圖用不同顏色與線段表示其線，並加入圖示(legend):

(1) y1(t) = 2[3exp(2t)-exp(-2t)]/[3exp(2t)+exp(-2t)] from t=0 to t=6.

(2) y2(x) = t + t exp(-1/t) from t = 0 to t=6.

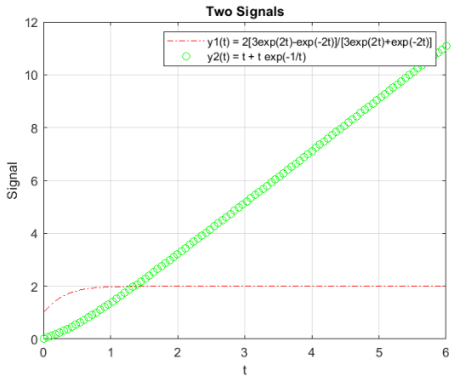
(1)

Discussion	
Ans	Code

	close all;
	t = linspace(0, 6, 100);
	y1 = 2 * [3*exp(2*t) - exp(-2*t)] ./ [3*exp(2*t) + exp(-2*t)]
	plot(t, y1);

(2)

Discussion	
Ans	Code

	y2 = t + t .* exp(-1 ./ t);
	figure(2);
	plot(t, y1,'r-.', t, y2, 'go');
	xlabel('t');
	ylabel('Signal');
	title('Two Signals');
	legend('y1(t) = 2[3exp(2t)-exp(-2t)]/[3exp(2t)+exp(-2t)]',
	'y2(t) = t + t exp(-1/t)');
	grid on;