MATLAB REVIEW

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Help

help	help	help browser	doc

Housekeeping

clear window	clc	clear workspace	clear	clear graph	close

Input and output

input numbers	=input(‘ ’)	input text	=input(‘ ’,’s’)	output	disp( )
reading file	load(‘name.format’)				

Type of value

8-bit integer	with symbol	int8( )	translate number to array	num2str( )
	without symbol	Uint8( )		

Basic variables

π	pi	∞	inf	non-numerical	NaN

Comparison

=	==	≠	~=	>	>
≥	>=	<	<	≤	<=
not	~condition1	and	(con1)&(con2)	or	(con1) | (con2)
xor=one true one false	xor(con1,con2)	all in array	all(condition)	any in array	any(condition)

Calculation

=	=	+	+	-	-
×	*	÷	/	a^n	a^(n)
e	exp( )	ln	log( )	n!=1×2×…×n	factorial(n)
sin	sin( )	cos	cos( )	tan	tan( )
random between 0 to 1	rand( )	remainder after ÷N	mod(,N)	round to nearest	round( )
round up	ceil( )	round down	floor( )	delete decimals	fix( )

Arrays and sub-arrays

$(1 \quad 2 \quad 3)$	[1 2 3]	$\begin{pmatrix}1\\2\\3\end{pmatrix}$	[1 ; 2 ; 3]	$\begin{pmatrix}1 & 30\\2 & 20\\3 & 10\end{pmatrix}$	[1 30 ; 2 20 ; 3 10]
$(a \quad a+1 \quad a+2 \quad \dots \quad b)$	a:b	$(a \quad a+i \quad a+2i \quad \dots \quad b)$	a:i:b	acegikm	‘a’:2:’m’
a×b all-zero matrix	zeros(a,b)	a×b all-one matrix	ones(a,b)	a×b ??? matrix	command(a,b)

extract 3 from $A=\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$	A(7) or A(1,3)	extract $(1 \quad 2 \quad 3)$ from $A=\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$	A(1 ; :)

extract $\begin{pmatrix}2 & 3\\5 & 6\end{pmatrix}$ from $A=\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$	A(1:2,2:3)	extract $\begin{pmatrix}1 & 3\\7 & 9\end{pmatrix}$ from $A=\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$	A(1:2:3 ; [1,3])

find maximum in A	in row	max(A, [ ], 2)	find minimum A	in row	min(A, [ ], 2)
	in column	max(A, [ ], 1)		in column	min(A, [ ], 1)
sum of A	in row	sum(A, 2)	average of A	in row	mean(A, [ ], 2)
	in column	sum(A, 1)		in column	mean(A, [ ], 1)
arrange A	from min to max	sort(A, 1 or 2)	arrange A according to the Nth column		sortrows(A, N, ' ')
	from max to min	sort(A, 1 or 2,'descend')			

find elements in A that meet condition	found=find(Acondition)	swap elements with other value in A	A(found)=value

Array calculation

=	=	A+b or A+B	+	A-b or A-B	-
A×B	*	A/B	/	A^b	^
×	.*	÷	./	A^N	A.^N
if Y*X=1	Y=inv(X)=X^(-1)	swap row & column	A.' or transpose(A)	/ and \	A/B=A*inv(B) A\B=inv(A)*B
sum of array	sum( )	max length	length( )	size of array	size(column,row)
C=A*B $A=\begin{pmatrix}A11 & A12\\A21 & A22\\A31 & A32\end{pmatrix}$ $B=\begin{pmatrix}B11 & B12 & B13\\B21 & B22 & B23\end{pmatrix}$	$C=\begin{pmatrix}(A11\times B11)+(A12\times B21) & (A11\times B12)+(A12\times B22) & (A11\times B13)+(A12\times B23)\\(A21\times B11)+(A22\times B21) & (A21\times B12)+(A22\times B22) & (A21\times B13)+(A22\times B23)\\(A31\times B11)+(A32\times B21) & (A31\times B12)+(A32\times B22) & (A31\times B13)+(A32\times B23)\end{pmatrix}$				

Solve linear equations

3x+2y-z=5 5y+2z=2 2x+3y-8z=9	Ax=B x=A^{-1}B	A=[3 2 -1 ; 0 5 2 ; 2 3 -8] B=[5 2 9]'	x=inv(A)*B or A\B

Statement, loops and functions

if statement	switch statement	for loop	while loop	function

if (condition1)
···code···
elseif (condition2)
···code···
elseif (condition3)
···code···
else
···code···.
end
	switch expression
	case (value1)
	···code···
	case (value2)
	···code···
	otherwise
	···code···
	end
		for start:i:end
		···code···
		end
			while condition
			···code···
			end
				function [out1,out2]=functionName(input1, input2)
				···code···
				End
				call function
				variable=functionName(input1, input2)

jump out the loop	break	directly into next loop	continue	back before loop	return

Plotting

Label line	legend( )	add title	title( )	adjust axis	axis square or equal or tight
label axis	x/y/zlabel(‘ ’)				
multiple curve	⋯plot⋯ hold on ⋯plot⋯ hold off	multiple graph for m×n array at position p	subplot(m,n,p) ⋯plot⋯	set graph	set(h, name, value)

2D plots	plot(x,y,’symbols, linestyles, colours’)	3D plots	ezsurf(‘ ’)
	ezplot(‘ ’)		ezmesh(‘ ’)

Complex number

a+bi	=a+bi =complex(a,b)	real parts	=real( )	imaginary parts	imag( )

Structures and cell arrays

structure	record						record(1).name=’John’ record(1).age=15 record(1).grade=[100 30;25 60] record(2).name=’James’ ⋯ record
	record(1)		record(2)		record(3)		
	.name	John	.name	James	.name	Jack	
	.age	15	.age	20	.age	18	
	.grade	$\begin{pmatrix}100 & 30\\25 & 60\end{pmatrix}$	.grade	$\begin{pmatrix}90 & 85\\75 & 65\end{pmatrix}$	.grade	$\begin{pmatrix}20 & 30\\23 & 15\end{pmatrix}$	

cell	1	‘text’		variable={1,’text’;[100 30;25 60],{ 2,’text’;[100 30;25 60],2+3i} OR variable(1,1)=1 variable(1,2)=’text’ ⋯
	$\begin{pmatrix}100 & 30\\25 & 60\end{pmatrix}$	2	’text’	
		$\begin{pmatrix}100 & 30\\25 & 60\end{pmatrix}$	2+3i	