MATLAB Reference Sheet
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IEEE-754

sign (s), mantissa (m), base (b), and exponent (e)
Formula: $(-1)^s * m * (b)^e$

MATLAB Tid Bits

MATLAB stands for Matrix Laboratory
MATLAB was first written in FORTAN
MATLAB was later rewritten in C
1 and l look similar but are different
1 is not a prime number in MATLAB

Basic Types

A scalar is a 1x1 array.
A row vector of length n is a 1xn array.
A column vector of length m is an mx1 array.
A matrix of dimensions m rows and n columns is an mxn array.

Naming Conventions

Case sensitive variable names
Must start with a letter (A-Z,a-z).
Up to 31 letters, digits, and underscores
No special characters besides underscores.
Can not be a reserved keyword.

Reserved Keywords

```
break
case
catch
classdef
continue
else
elseif
end
for
function
global
if
otherwise
parfor
persistent
return
spmd
switch
try
while
```

Special Characters

[]	forms matrices
()	used in statements to group operations
.	decimal point
,	separates subscripts or matrix elements
;	separates rows in a matrix definition or suppresses output
:	indicates all rows or all columns
=	assignment operator (not equality)
%	indicates a comment
%%	cell divider
+	addition
-	ubtraction
*	multiplication
.*	array multiplication
/	division
./	array division
ˆ	exponential
.ˆ	array exponential

Special Variables/Constants

ans	default variable for last calculation
eps	1
flops	count of oating point operations
Inf	infinity
NaNa	NaN
pi	the math pi (3.1415)
i,j	$\sqrt{-1}$
realmax	largest real number MATLAB can represent
realmin	smallest real number MATLAB can represent
intmax	returns largest possible integer used in MATLAB
intmin	returns smallest possible integer used in MATLAB
clock	returns the time
date	returns the date

Basic Commands and Functions

Clc	clears command window
clear	clears workspace
Diary	creates a copy of all commands and most results
exit	terminates MATLAB
help	invokes help utility
helpwin	invokes windowed help utility
length	length of a vector or maximum dimension of an array
size	display dimensions of a particular array
quite	terminates MATLAB
save	saves variables in a file
who	lists variables in memory
whos	lists variable names, sizes, and types in memory

Relational and Logical Operators

<	less than
<==	less than or equal to
>	greater than
>==	greater than or equal to
==	equal to
~=	not equal to
&	and
!	or
~	not

Conditional Statements

```
if expression
    statements
elseif expression
    statements
else
    statements
end


switch switch_expression
    case case_expression
        statements
    case case_expression
        statements
    otherwise
        statements
end
```

Loops

```
for k = vectorOrColumnList
    statements
end


while logicalExpression
    statements
end
```

User Defined Functions

```
normal - function [out1,out2] = func_name(inp1,inp2)..end
anonymous - var_name = @(inp1,inpt2) (inp1*inp2)
```

Vector/Matrix Stuff

linspace(a,b,N)	spaced intervals btwn a & b comprised of N pts
zeros(m,n)	an m by n array of zeroes
zeros(n)	an n by n array of zeroes
ones(m,n)	an m by n array of ones
ones(n)	an n by n array of ones
eye(m,n)	an m by n array with ones on the diagonal
eye(n)	an n by n identity matrix
ones(n)	an n by n array of ones
rand(m,n)	an m by n array of random numbers
rand(n)	an n by n array of random numbers
i:k:l	list generation: 1stV alue : Stride : LastV alue
v(1)	1st element of vector v
v(end)	last element of vector v
v(1:2:9)	1st, 3rd, 5th, 7th, 9th elements of vector v
v(2:3:9)	2nd, 5th, 8th elements of vector v
A(2,3)	2nd row, 3rd column of matrix A
A(:,3)	all elements in column 3
A(1,:)	all elements in row 1
A(1:2:end,:)	all odd rows of matrix A
A(1:2,2:4)	sub-matrix of rows 1 and 2, columns 2 through 4
A(1,end)	last element in 1st row