MATLAB Quick Guide

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Basic

`%`	Begins a comment to the end of the line.
`,`	Separates expressions without suppressing output.
`;`	Separates expressions and suppresses output. Inside brackets, end of row.
`...`	Continues command in next line.
`help fun`	Displays help on function or command.
`doc fun`	Displays help in help browser.
`lookfor keyword`	Searches all functions for `keyword`.

Operators in order of precedence

`a.'`	Transpose, $\mathbf{a}^T$.
`a .^ b`	Power, a^b.
`a'`	Complex conjugate transpose, $\mathbf{a}^{T*}$.
`a ^ b`	Matrix power, $\mathbf{a}^b$.
`+a`	Unary plus, $+a$.
`-a`	Unary minus, $-a$.
`~a`	Logical negation, NOT a.
`a .* b`	Multiplication, ab.
`a ./ b`	Right division, $\frac{a}{b}$.
`a .\ b`	Left division, $\frac{b}{a}$.
`a * b`	Matrix multiplication, $\mathbf{ab}$.
`a / b`	Matrix right division, $\mathbf{ab}^{-1}$.
`a \ b`	Matrix left division, $\mathbf{a}^{-1}\mathbf{b}$.
`a + b`	Addition, $a+b$.
`a - b`	Subtraction, $a-b$.
`j:k`	$\begin{bmatrix} j & j+1 & \dots & k \end{bmatrix}$.
`j:d:k`	$\begin{bmatrix} j & j+d & \dots & k \end{bmatrix}$.
`a < b`	Less than, $a < b$.
`a <= b`	Less than or equal to, $a \le b$.
`a > b`	Greater than, $a > b$.
`a >= b`	Greater than or equal to, $a \ge b$.
`a == b`	Equal to, $a = b$.
`a ~= b`	Not equal to, $a \ne b$.
`a & b`	Element-wise logical AND, a AND b.
`a | b`	Element-wise logical OR, a OR b.
`a && b`	Short-circuit logical AND, a AND b.
`a || b`	Short-circuit logical OR, a OR b.

Workspace

`a = 1`	Assignment to variable `a`.
`clear`	Clears all variables from the workspace.
`clear v1 v2`	Clears the specified variables.
`save file`	Saves workspace to `file.mat`.
`load file`	Loads variables from `file.mat`.
`global v1 v2`	Defines variables as global in scope.

Special variable names

`ans`	The last answer not assigned to a variable.
`i`, `j`	The imaginary unit i, that is, $\sqrt{-1}$.
`pi`	The number π.
`Inf`	Positive infinity, e.g., `1/0`.
`NaN`	Not a Number, undefined, e.g., `0/0`.

Commonly used functions

`exp(x)`	Exponential, e^x.
`sqrt(x)`	Square root, $\sqrt{x}$.
`log(x)`	Natural logarithm, $\ln x$.
`log10(x)`	Common (base 10) logarithm, $\log^{10} x$.
`ceil(x)`	Round to nearest integer towards $+\infty$.
`floor(x)`	Round to nearest integer towards $-\infty$.
`round(x)`	Round to the nearest integer.
`sign(x)`	Signum function, $+1$ if $x > 0$, 0 if $x = 0$, -1 if $x < 0$.

Complex numbers

`abs(z)`	Absolute value, $\lvert z \rvert$.
`angle(z)`	Argument of value, $\angle z$.
`conj(z)`	Complex conjugate, z^*.
`real(z)`	Real part of value, $\Re\{z\}$.
`imag(z)`	Imaginary part of value, $\Im\{z\}$.

Trigonometric functions

`sin(x)`	Sine, $\sin x$.
`cos(x)`	Cosine, $\cos x$.
`tan(x)`	Tangent, $\tan x$.
`asin(x)`	Inverse sine, $\sin^{-1} x$.
`acos(x)`	Inverse cosine, $\cos^{-1} x$.
`atan(x)`	Inverse tangent, $\tan^{-1} x$.
`sinh(x)`	Hyperbolic sine, $\sinh x$.
`asinh(x)`	Inverse hyperbolic sine, $\sinh^{-1} x$.
`sind(x)`	Sine of x in degrees, $\sin(\pi x/180)$.
`asind(x)`	Inverse sine in degrees,$(180/\pi)\sin^{-1} x$.

Conditionals and loops

`if cond1`
`  statements1`
`elseif cond2`
`  statements2`
`else`
`  statements3`
`end`
	Perform the statements following the first real condition. The `elseif` and `else` parts are optional. More than one `elseif` part can be used.

`for c = cols`
`  statements`
`end`
	Iterates over `statements`, with `c` having each of the columns `cols` in turn.

`while cond`
`  statements`
`end`
	Iterates over `statements` until `cond` becomes false.

Matrices

`zeros(m, n)`	Creates an $m \times n$ matrix of zeros.
`ones(m, n)`	Creates an $m \times n$ matrix of ones.
`eye(n)`	Creates an $n \times n$ identity matrix.
`rand(m, n)`	Creates an $m \times n$ matrix of uniform random numbers in $[0, 1)$.
`randn(m, n)`	Creates an $m \times n$ matrix of Gaussian random numbers, $\mu = 0$, $\sigma^2 = 1$.

Portions of matrices

`a(j:k)`	The elements $\begin{bmatrix} a_j & a_{j+1} & \dots & a_k \end{bmatrix}$.
`a(j:d:k)`	The elements $\begin{bmatrix} a_j & a_{j+d} & \dots & a_k \end{bmatrix}$.
`a(j:end)`	The elements $\begin{bmatrix} a_j & a_{j+1} & \dots \end{bmatrix}$.
`a(:)`	All elements of $\mathbf{a}$.
`a(m, j:k)`	The row $\begin{bmatrix} a_{mj} & a_{mj+1} & \dots & a_{mk} \end{bmatrix}$.
`a(:, n)`	The `n`th column of $\mathbf{a}$.

Plotting

`title(t)`	Sets the title to t.
`plot(x, y)`	Plots y against x on linear axis.
`xlabel(l)`	Sets the x-axis label to l.
`legend(l, ...)`	Sets the legend labels to $l, \dots$.
`figure`	Creates a new figure window.
`subplot(m,n,p)`	Splits the figure into $m \times n$ panes, and selects pane p.
`close`	Closes the current figure window.
`close all`	Closes all the figure windows.
`saveas(h, f)`	Saves figure handle h to filename f.
`saveas(gcf, f)`	Saves the current figure to filename f.