

Matlab Basics Quick Reference

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1 Workspace & Help

<code>doc</code>	Open help browser.
<code>help</code>	Display help of a command.
<code>lookfor</code>	Search functions with a keyword.
<code>whos</code>	Display all defined variables.
<code>clear</code>	Clear workspace variables.
<code>diary</code>	Save command window input/output to a file.

2 Assignment and indexing

<code>a=[1;2;3]</code>	Set the variable <code>a</code> to a column vector (1, 2, 3).
<code>[1,2,3;4,5,6]</code>	Matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$.
<code>[X Y]</code>	Block matrix $\begin{bmatrix} X & Y \end{bmatrix}$.
<code>2:5</code>	A vector (2, 3, 4, 5).
<code>1:3:10</code>	A vector (1, 4, 7, 10).
<code>a(2)</code>	2nd element of a vector.
<code>a(1,2)</code>	(1,2):th element of a matrix.
<code>a(1,:)</code>	first row of a matrix.
<code>a(:,3)=b</code>	Set the third column of matrix <code>a</code> to the value <code>b</code> .
<code>a(3:2:end,:)</code>	Matrix formed by every second rows from the third to the last row of <code>a</code> .
<code>[a,b]=fun(x,y)</code>	Call function <code>fun</code> with arguments <code>x</code> and <code>y</code> and assign the two return values to variables <code>a</code> and <code>b</code> .

3 Default variables

<code>ans</code>	Answer of the most recent unassigned calculation.
<code>pi</code>	Value of π .
<code>i</code> or <code>j</code>	Imaginary unit.
<code>inf</code>	Positive infinity.
<code>nan</code>	Not-a-number.

4 Elementary matrix operations

<code>linspace</code>	Linearly spaced vector.
<code>eye</code>	Identity matrix.
<code>diag</code>	Diagonal matrix or diagonal of a matrix.
<code>rand</code>	Random matrix with elements uniformly distributed in (0, 1).
<code>zeros</code>	Matrix of zeros.
<code>ones</code>	Matrix of ones.
<code>length</code>	Length of a vector.
<code>size</code>	Size of a matrix.
<code>repmat</code>	Replicate matrix.
<code>find</code>	Find nonzero elements.

See also: `help elmat`.

5 Elementary math functions

For example, `sin`, `cos`, `tan`, `asin`, `acos`, `atan`, `sqrt`, `exp`, `log`, `abs`, `mod`.

See also: `help elfun`.

6 Operators

<code>a+b</code> (or <code>a-b</code>)	Matrix addition (subtraction).
<code>a*b</code>	Matrix product.
<code>a\b</code>	Matrix right-division.
<code>a^n</code>	Matrix exponent.
<code>a.'</code> (or <code>a'</code>)	(Conjugate) transpose.
<code>a.*b</code>	Elementwise product.
<code>a./b</code> (or <code>a.\b</code>)	Elementwise division from left (right).
<code>a.^n</code>	Elementwise exponentiation.
<code>==</code> (or <code>~=</code>)	Is (not) equal to.
<code><=</code> (or <code><</code>)	Is (strictly) less than.
<code>>=</code> (or <code>></code>)	Is (strictly) greater than.
<code>~</code>	Logical not.
<code>&</code>	Logical and.
<code> </code>	Logical or.

See also: `help ops`.

7 Linear algebra

<code>det</code>	Matrix determinant.
<code>eig</code>	Eigenvalues and eigenvectors.
<code>inv</code> (or <code>pinv</code>)	Matrix inverse (or pseudoinverse).
<code>norm</code>	Vector or matrix norm.
<code>rank</code>	Matrix rank.
<code>svd</code>	Singular value decomposition.

See also: `help matfun`.

8 Graphics functions

<code>plot</code>	Simple plot.
<code>hold</code>	Multiple graphs in the same figure.
<code>figure</code>	Create a new figure.
<code>clf</code>	Clear current figure.
<code>grid</code>	Toggle grid.
<code>title</code>	Title of the figure.
<code>xlabel</code>	Label of x axis.
<code>ylabel</code>	Label of y axis.
<code>print</code>	Print or save the graph.

See also: `help graph2d`, `help graph3d`, `help specgraph`.

9 Program flow

<code>if COND ...; elseif COND ...; else ...; end</code>	
<code>for k=VALUES ...; end</code>	
<code>while COND ...; end</code>	
where <code>COND</code> is a logical expression, and <code>VALUES</code> is a row vector of values, e.g. <code>1:10</code> .	
<code>break</code>	Terminate execution of a loop.
<code>continue</code>	Next iteration of a loop.
<code>function</code>	Add a new function.
<code>return</code>	Return from a function.