

A Summary of MATLAB Commands Used

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We provide below a quick review with a brief description of all MATLAB functions used in this book. For additional details on these functions, use the `help` command.

Function	Description
<code>abs</code>	Computes the absolute value
<code>angle</code>	Computes the phase angle in radians
<code>axis</code>	Sets manual scaling of axes on plots
<code>blackman</code>	Generates the Blackman window coefficients
<code>break</code>	Terminates the execution of loops
<code>butter</code>	Designs digital and analog Butterworth filters of all four types
<code>buttord</code>	Selects the minimum order of the digital or analog Butterworth transfer function
<code>ceil</code>	Rounds to the nearest integer towards $+\infty$
<code>cheb1ord</code>	Selects the minimum order of the digital or analog Type 1 Chebyshev transfer function
<code>cheb2ord</code>	Selects the minimum order of the digital or analog Type 2 Chebyshev transfer function
<code>chebwin</code>	Generates the Dolph-Chebyshev window coefficients
<code>cheby1</code>	Designs digital and analog Type 1 Chebyshev filters of all four types
<code>cheby2</code>	Designs digital and analog Type 2 Chebyshev filters of all four types
<code>clf</code>	Deletes all objects from the current figure
<code>conj</code>	Computes the complex conjugate
<code>conv</code>	Performs the multiplication of two polynomials
<code>cos</code>	Computes the cosine
<code>decimate</code>	Decreases the sampling rate of a sequence by an integer factor
<code>deconv</code>	Performs polynomial division
<code>disp</code>	Displays text or a matrix on the screen
<code>echo</code>	Echoes M-files during execution
<code>ellip</code>	Designs digital and analog elliptic filters of all four types
<code>ellipord</code>	Selects the minimum order of the digital or analog elliptic transfer function
<code>else</code>	Delineates an alternate block of statements inside an <code>if</code> loop

<code>elseif</code>	Conditionally executes a block of statements inside an <code>if</code> loop
<code>end</code>	Terminates a loop
<code>eps</code>	Indicates floating-point relative accuracy
<code>error</code>	Displays an error message
<code>exp</code>	Computes the exponential
<code>fft</code>	Computes the discrete Fourier transform coefficients
<code>filter</code>	Filters data with an IIR or FIR filter implemented in the transposed direct form II structure
<code>filtfilt</code>	Performs zero-phase filtering of data
<code>fir1</code>	Designs linear-phase FIR filters of all four types using the windowed Fourier series method
<code>fir2</code>	Designs linear-phase FIR filters with arbitrary magnitude responses using the windowed Fourier series method
<code>firpm</code>	Designs linear-phase FIR filters using the Parks-McClellan algorithm
<code>firpmord</code>	Determines the approximate order, normalized band edges, frequency band magnitude levels, and weights to use with the <code>firpm</code> command
<code>fix</code>	Rounds towards zero
<code>fliplr</code>	Flips matrices left to right
<code>for</code>	Used for repeated execution of a block of statements a specific number of times
<code>format</code>	Controls the format of the output display
<code>freqs</code>	Computes the complex frequency response of an analog transfer function at specified frequency points
<code>freqz</code>	Computes the complex frequency response of a digital transfer function at specified frequency points
<code>function</code>	Used to generate new M-functions
<code>grid</code>	Adds or deletes grid lines to or from the current plot
<code>grpdelay</code>	Computes the group delay of a digital transfer function at specified frequency points
<code>gtext</code>	Places a text on a graph with the aid of a mouse
<code>hamming</code>	Generates the Hamming window coefficients
<code>hann</code>	Generates the von Hann window coefficients
<code>help</code>	Provides online documentation for MATLAB functions and M-files
<code>hold</code>	Holds the current graph
<code>if</code>	Conditionally executes statements
<code>ifft</code>	Computes the inverse discrete Fourier transform coefficients
<code>imag</code>	Determines the imaginary part of a complex number or matrix
<code>impz</code>	Computes a specific number of the impulse response coefficients of a digital transfer function
<code>input</code>	Requests data to be supplied by the user
<code>interp</code>	Increases the sampling rate of a sequence by an integer factor
<code>inv</code>	Determines the inverse of a matrix
<code>kaiser</code>	Determines the Kaiser window coefficients

kaiserord	Determines the filter order and the parameter β of a Kaiser window
latc2tf	Determines the transfer function from the specified lattice parameters and the feed-forward coefficients of the Gray-Markel realization
legend	Inserts a legend on the current plot using the specified strings as labels
length	Determines the length of a vector
linspace	Generates linearly spaced vectors
load	Retrieves saved data from the disk
log10	Computes the common logarithm
lookfor	Provides keyword search through all help entries
max	Determines the largest element of a vector
min	Determines the smallest element of a vector
NaN	Not-a-number
nargin	Indicates the number of arguments inside the body of a function M-file
num2str	Converts a number to its string representation
ones	Generates a vector or a matrix with element values 1
pause	Halts execution temporarily until user presses any key
pi	Returns the floating-point number nearest to π
plot	Generates linear 2-D plots
poly2rc	Determines the coefficients in the cascade realization of an IIR allpass transfer function
rand	Generates random numbers and matrices uniformly distributed in the interval (0,1)
randn	Generates random numbers and matrices normally distributed with zero mean and unity variance
real	Determines the real part of a complex number or matrix
rem	Determines the remainder of a matrix divided by another matrix of same size
resample	Changes the sampling rate of a sequence by a rational number
residue	Determines the partial-fraction of a discrete-time transfer function expressed as a ratio of polynomials in z
residuez	Determines the partial-fraction of a discrete-time transfer function expressed as a ratio of polynomials in z^{-1}
return	Causes a return to the keyboard or to the invoking function
roots	Determines the roots of a polynomial
save	Saves workspace variables on a disk
sawtooth	Generates a sawtooth wave with a period 2π
sign	Implements the signum function
sin	Determines the sine
sinc	Computes the sinc function of a vector or array
size	Returns the matrix dimensions
sqrt	Computes the square root
square	Generates a square wave with a period 2π

stairs	Draws a staircase graph
stem	Plots the data sequence as stems from the x axis terminated with circles for the data value
subplot	Breaks figure window into multiple rectangular panes for the display of multiple plots
sum	Determines the sum of all elements in a vector
tf2latc	Determines the lattice-parameters and the feed-forward coefficients in the Gray-Markel realization of an IIR transfer function
tf2zp	Determines the zeros, poles, and gains of the specified transfer function
title	Write specified text on the top of the current plot
unwrap	Eliminates jumps in phase angles to provide smooth transition across branch cuts
what	Provides directory listing of files
which	Locates functions and files
while	Repeats statements an indefinite number of times
who	Lists the current variables in the memory
whos	Lists the current variables in the memory, their sizes, and whether they have non-zero imaginary parts
xlabel	Write specified text below the x -axis of the current 2-D plot
ylabel	Write specified text on the left side of the y -axis of the current 2-D plot
zeros	Generates a vector or a matrix with element 0
zp2sos	Determines an equivalent second-order representation from a specified zero-pole-gain representation
zp2tf	Determines the numerator and the denominator coefficients of a transfer function from its specified zeros, poles, and gains
zplane	Displays poles and zeros in the z -plane