

ZUSAMMENFASSUNG UND KURZBESCHREIBUNG ALLER MATLAB-BEFEHLE VERSION 6.5

(und wichtiger Toolboxen)

Versionen:

MATLAB	Version 6.5
Signal Processing Toolbox	Version 6.0
Simulink	Version 5.0
Optimization Toolbox	Version 2.2

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1. MATLAB

1.1 General purpose commands

General information

helpbrowser - Bring up the help browser.
 doc - Complete on-line help, displayed in the help browser.
 help - M-file help, displayed at the command line.
 helpwin - M-file help, displayed in the help browser.
 lookfor - Search all M-files for keyword.
 syntax - Help on MATLAB command syntax.
 support - Open MathWorks Technical Support Web Page.
 demo - Run demonstrations.
 ver - MATLAB, SIMULINK, and toolbox version information.
 version - MATLAB version information.
 whatsnew - Access Release Notes.

Managing the workspace.

who - List current variables.
 whos - List current variables, long form.
 workspace - Display Workspace Browser, a GUI for managing the workspace.
 clear - Clear variables and functions from memory.
 pack - Consolidate workspace memory.
 load - Load workspace variables from disk.
 save - Save workspace variables to disk.
 quit - Quit MATLAB session.

Managing commands and functions.

what - List MATLAB-specific files in directory.
 type - List M-file.
 edit - Edit M-file.
 open - Open files by extension.
 which - Locate functions and files.
 pcode - Create pre-parsed pseudo-code file (P-file).
 inmem - List functions in memory.
 mex - Compile MEX-function.

Managing the search path

path - Get/set search path.
 addpath - Add directory to search path.
 rmpath - Remove directory from search path.
 pathtool - Modify search path.
 rehash - Refresh function and file system caches.
 import - Import Java packages into the current scope.

Controlling the command window.

echo - Echo commands in M-files.
 more - Control paged output in command window.
 diary - Save text of MATLAB session.
 format - Set output format.
 beep - Produce beep sound.

Operating system commands

cd - Change current working directory.
 copyfile - Copy a file or directory.
 movefile - Move a file or directory.
 delete - Delete file.
 pwd - Show (print) current working directory.
 dir - List directory.
 fileattrib - Get or set attributes of files and directories.
 isdir - True if argument is a directory.
 mkdir - Make directory.
 rmdir - Remove directory.
 getenv - Get environment variable.
 ! - Execute operating system command (see PUNCT).
 dos - Execute DOS command and return result.
 unix - Execute UNIX command and return result.
 system - Execute system command and return result.
 perl - Execute Perl command and return result.
 web - Open Web browser on site or files.
 computer - Computer type.
 isunix - True for the UNIX version of MATLAB.
 ispc - True for the PC (Windows) version of MATLAB.

Debugging M-files.

debug - List debugging commands.
 dbstop - Set breakpoint.
 dbclear - Remove breakpoint.
 dbcont - Continue execution.
 dbdown - Change local workspace context.
 dbstack - Display function call stack.
 dbstatus - List all breakpoints.
 dbstep - Execute one or more lines.
 dbtype - List M-file with line numbers.
 dbup - Change local workspace context.
 dbquit - Quit debug mode.
 dbmex - Debug MEX-files (UNIX only).

Profiling M-files.

profile - Profile function execution time.
 profreport - Generate profile report.

Tools to locate dependent functions of an M-file.

depfun - Locate dependent functions of an m-file.
 depdir - Locate dependent directories of an m-file.
 inmem - List functions in memory.

See also PUNCT.

1.2 Operators and special characters

Arithmetic operators.

plus	- Plus	+
uplus	- Unary plus	+
minus	- Minus	-
uminus	- Unary minus	-
mtimes	- Matrix multiply	*
times	- Array multiply	.*
mpower	- Matrix power	^
power	- Array power	.^
mldivide	- Backslash or left matrix divide	\
mrdivide	- Slash or right matrix divide	/
ldivide	- Left array divide	.\
rdivide	- Right array divide	./
kron	- Kronecker tensor product	kron

Relational operators.

eq	- Equal	==
ne	- Not equal	~=
lt	- Less than	<
gt	- Greater than	>
le	- Less than or equal	<=
ge	- Greater than or equal	>=

Logical operators.

	Short-circuit logical AND	&&
	Short-circuit logical OR	
and	- Element-wise logical AND	&
or	- Element-wise logical OR	
not	- Logical NOT	~
xor	- Logical EXCLUSIVE OR	
any	- True if any element of vector is nonzero	
all	- True if all elements of vector are nonzero	

Special characters.

colon	- Colon	:
paren	- Parentheses and subscripting	()
paren	- Brackets	[]
paren	- Braces and subscripting	{ }
punct	- Function handle creation	@
punct	- Decimal point	.
punct	- Structure field access	.
punct	- Parent directory	..
punct	- Continuation	...
punct	- Separator	,
punct	- Semicolon	;
punct	- Comment	%
punct	- Invoke operating system command	!
punct	- Assignment	=
punct	- Quote	'
transpose	- Transpose	.'

ctranspose	- Complex conjugate transpose	'
horzcat	- Horizontal concatenation	[,]
vertcat	- Vertical concatenation	[:,]
subsasgn	- Subscripted assignment	(), { }, ..
subsref	- Subscripted reference	(), { }, ..
subsindex	- Subscript index	

Bitwise operators.

bitand	- Bit-wise AND.
bitcmp	- Complement bits.
bitor	- Bit-wise OR.
bitmax	- Maximum floating point integer.
bitxor	- Bit-wise XOR.
bitset	- Set bit.
bitget	- Get bit.
bitshift	- Bit-wise shift.

Set operators.

union	- Set union.
unique	- Set unique.
intersect	- Set intersection.
setdiff	- Set difference.
setxor	- Set exclusive-or.
ismember	- True for set member.

See also ARITH, RELOP, SLASH, FUNCTION_HANDLE.

1.3 Programming language constructs

Control flow.

if	- Conditionally execute statements.
else	- IF statement condition.
elseif	- IF statement condition.
end	- Terminate scope of FOR, WHILE, SWITCH, TRY and IF statements.
for	- Repeat statements a specific number of times.
while	- Repeat statements an indefinite number of times.
break	- Terminate execution of WHILE or FOR loop.
continue	- Pass control to the next iteration of FOR or WHILE loop.
switch	- Switch among several cases based on expression.
case	- SWITCH statement case.
otherwise	- Default SWITCH statement case.
try	- Begin TRY block.
catch	- Begin CATCH block.
return	- Return to invoking function.
error	- Display error message and abort function.
rethrow	- Reissue error and abort function.

Evaluation and execution.

eval	- Execute string with MATLAB expression.
evalc	- Evaluate MATLAB expression with capture.

feval - Execute function specified by string.
 evalin - Evaluate expression in workspace.
 builtin - Execute built-in function from overloaded method.
 assignin - Assign variable in workspace.
 run - Run script.

Scripts, functions, and variables.

script - About MATLAB scripts and M-files.
 function - Add new function.
 global - Define global variable.
 persistent - Define persistent variable.
 mfilename - Name of currently executing M-file.
 lists - Comma separated lists.
 exist - Check if variables or functions are defined.
 isglobal - True for global variables.
 mlock - Prevent M-file from being cleared.
 munlock - Allow M-file to be cleared.
 mislocked - True if M-file cannot be cleared.
 precedence - Operator Precedence in MATLAB.
 isvarname - Check for a valid variable name.
 iskeyword - Check if input is a keyword.
 namelengthmax - Maximum length of a MATLAB name.

Argument handling.

nargchk - Validate number of input arguments.
 nargoutchk - Validate number of output arguments.
 nargin - Number of function input arguments.
 nargout - Number of function output arguments.
 varargin - Variable length input argument list.
 varargout - Variable length output argument list.
 inputname - Input argument name.

Message display.

warning - Display warning message.
 lasterr - Last error message.
 lasterror - Last error message and related information.
 lastwarn - Last warning message.
 disp - Display an array.
 display - Overloaded function to display an array.
 fprintf - Display formatted message.
 sprintf - Write formatted data to a string.

Interactive input.

input - Prompt for user input.
 keyboard - Invoke keyboard from M-file.
 pause - Wait for user response.
 uimenu - Create user interface menu.
 uicontrol - Create user interface control.

1.4 Elementary matrices and matrix manipulation

Elementary matrices.

zeros - Zeros array.
 ones - Ones array.
 eye - Identity matrix.
 repmat - Replicate and tile array.
 rand - Uniformly distributed random numbers.
 randn - Normally distributed random numbers.
 linspace - Linearly spaced vector.
 logspace - Logarithmically spaced vector.
 freqspace - Frequency spacing for frequency response.
 meshgrid - X and Y arrays for 3-D plots.
 : - Regularly spaced vector and index into matrix.

Basic array information.

size - Size of array.
 length - Length of vector.
 ndims - Number of dimensions.
 numel - Number of elements.
 disp - Display matrix or text.
 isempty - True for empty array.
 isequal - True if arrays are numerically equal.
 isequalwithequalnans - True if arrays are numerically equal.
 isnumeric - True for numeric arrays.
 islogical - True for logical array.
 logical - Convert numeric values to logical.

Matrix manipulation.

cat - Concatenate arrays.
 reshape - Change size.
 diag - Diagonal matrices and diagonals of matrix.
 blkdiag - Block diagonal concatenation.
 tril - Extract lower triangular part.
 triu - Extract upper triangular part.
 fliplr - Flip matrix in left/right direction.
 flipud - Flip matrix in up/down direction.
 flipdim - Flip matrix along specified dimension.
 rot90 - Rotate matrix 90 degrees.
 : - Regularly spaced vector and index into matrix.
 find - Find indices of nonzero elements.
 end - Last index.
 sub2ind - Linear index from multiple subscripts.
 ind2sub - Multiple subscripts from linear index.

Multi-dimensional array functions.

ndgrid - Generate arrays for N-D functions and interpolation.
 permute - Permute array dimensions.
 ipermute - Inverse permute array dimensions.
 shiftdim - Shift dimensions.
 circshift - Shift array circularly.
 squeeze - Remove singleton dimensions.

Special variables and constants.

ans	- Most recent answer.
eps	- Floating point relative accuracy.
realmax	- Largest positive floating point number.
realmin	- Smallest positive floating point number.
pi	- 3.1415926535897....
i, j	- Imaginary unit.
inf	- Infinity.
NaN	- Not-a-Number.
isnan	- True for Not-a-Number.
isinf	- True for infinite elements.
isfinite	- True for finite elements.
why	- Succinct answer.

Specialized matrices.

compan	- Companion matrix.
gallery	- Higham test matrices.
hadamard	- Hadamard matrix.
hankel	- Hankel matrix.
hilb	- Hilbert matrix.
invhilb	- Inverse Hilbert matrix.
magic	- Magic square.
pascal	- Pascal matrix.
rosser	- Classic symmetric eigenvalue test problem.
toeplitz	- Toeplitz matrix.
vander	- Vandermonde matrix.
wilkinson	- Wilkinson's eigenvalue test matrix.

1.5 Elementary math functions

Trigonometric.

sin	- Sine.
sinh	- Hyperbolic sine.
asin	- Inverse sine.
asinh	- Inverse hyperbolic sine.
cos	- Cosine.
cosh	- Hyperbolic cosine.
acos	- Inverse cosine.
acosh	- Inverse hyperbolic cosine.
tan	- Tangent.
tanh	- Hyperbolic tangent.
atan	- Inverse tangent.
atan2	- Four quadrant inverse tangent.
atanh	- Inverse hyperbolic tangent.
sec	- Secant.
sech	- Hyperbolic secant.
asec	- Inverse secant.
asech	- Inverse hyperbolic secant.
csc	- Cosecant.
csch	- Hyperbolic cosecant.

acsc	- Inverse cosecant.
acsch	- Inverse hyperbolic cosecant.
cot	- Cotangent.
coth	- Hyperbolic cotangent.
acot	- Inverse cotangent.
acoth	- Inverse hyperbolic cotangent.

Exponential.

exp	- Exponential.
log	- Natural logarithm.
log10	- Common (base 10) logarithm.
log2	- Base 2 logarithm and dissect floating point number.
pow2	- Base 2 power and scale floating point number.
realpow	- Power that will error out on complex result.
reallog	- Natural logarithm of real number.
realsqrt	- Square root of number greater than or equal to zero.
sqrt	- Square root.
nextpow2	- Next higher power of 2.

Complex.

abs	- Absolute value.
angle	- Phase angle.
complex	- Construct complex data from real and imaginary parts.
conj	- Complex conjugate.
imag	- Complex imaginary part.
real	- Complex real part.
unwrap	- Unwrap phase angle.
isreal	- True for real array.
cplxpair	- Sort numbers into complex conjugate pairs.

Rounding and remainder.

fix	- Round towards zero.
floor	- Round towards minus infinity.
ceil	- Round towards plus infinity.
round	- Round towards nearest integer.
mod	- Modulus (signed remainder after division).
rem	- Remainder after division.
sign	- Signum.

1.6 Specialized math functions

Specialized math functions.

airy	- Airy functions.
besselj	- Bessel function of the first kind.
bessely	- Bessel function of the second kind.
besselh	- Bessel functions of the third kind (Hankel function).
besseli	- Modified Bessel function of the first kind.
besselk	- Modified Bessel function of the second kind.
beta	- Beta function.
betainc	- Incomplete beta function.
betaln	- Logarithm of beta function.

ellipj - Jacobi elliptic functions.
 ellipke - Complete elliptic integral.
 erf - Error function.
 erfc - Complementary error function.
 erfcx - Scaled complementary error function.
 erfinv - Inverse error function.
 expint - Exponential integral function.
 gamma - Gamma function.
 gammaln - Incomplete gamma function.
 gammaln - Logarithm of gamma function.
 psi - Psi (polygamma) function.
 legendre - Associated Legendre function.
 cross - Vector cross product.
 dot - Vector dot product.

Number theoretic functions.

factor - Prime factors.
 isprime - True for prime numbers.
 primes - Generate list of prime numbers.
 gcd - Greatest common divisor.
 lcm - Least common multiple.
 rat - Rational approximation.
 rats - Rational output.
 perms - All possible permutations.
 nchoosek - All combinations of N elements taken K at a time.
 factorial - Factorial function.

Coordinate transforms.

cart2sph - Transform Cartesian to spherical coordinates.
 cart2pol - Transform Cartesian to polar coordinates.
 pol2cart - Transform polar to Cartesian coordinates.
 sph2cart - Transform spherical to Cartesian coordinates.
 hsv2rgb - Convert hue-saturation-value colors to red-green-blue.
 rgb2hsv - Convert red-green-blue colors to hue-saturation-value.

1.7 Matrix functions - numerical linear algebra

Matrix analysis.

norm - Matrix or vector norm.
 normest - Estimate the matrix 2-norm.
 rank - Matrix rank.
 det - Determinant.
 trace - Sum of diagonal elements.
 null - Null space.
 orth - Orthogonalization.
 rref - Reduced row echelon form.
 subspace - Angle between two subspaces.

Linear equations.

\ and / - Linear equation solution; use "help slash".
 inv - Matrix inverse.

rcond - LAPACK reciprocal condition estimator
 cond - Condition number with respect to inversion.
 condest - 1-norm condition number estimate.
 normest1 - 1-norm estimate.
 chol - Cholesky factorization.
 cholinc - Incomplete Cholesky factorization.
 lu - LU factorization.
 luinc - Incomplete LU factorization.
 qr - Orthogonal-triangular decomposition.
 lsqnonneg - Linear least squares with nonnegativity constraints.
 pinv - Pseudoinverse.
 lscov - Least squares with known covariance.

Eigenvalues and singular values.

eig - Eigenvalues and eigenvectors.
 svd - Singular value decomposition.
 gsvd - Generalized singular value decomposition.
 eigs - A few eigenvalues.
 svds - A few singular values.
 poly - Characteristic polynomial.
 polyeig - Polynomial eigenvalue problem.
 condeig - Condition number with respect to eigenvalues.
 hess - Hessenberg form.
 qz - QZ factorization for generalized eigenvalues.
 schur - Schur decomposition.

Matrix functions.

expm - Matrix exponential.
 logm - Matrix logarithm.
 sqrtm - Matrix square root.
 funm - Evaluate general matrix function.

Factorization utilities

qrdelete - Delete a column or row from QR factorization.
 qrinsert - Insert a column or row into QR factorization.
 rsf2csf - Real block diagonal form to complex diagonal form.
 cdf2rdf - Complex diagonal form to real block diagonal form.
 balance - Diagonal scaling to improve eigenvalue accuracy.
 planerot - Givens plane rotation.
 cholupdate - rank 1 update to Cholesky factorization.
 grupdate - rank 1 update to QR factorization.

1.8 Data analysis and Fourier transforms

Basic operations.

max - Largest component.
 min - Smallest component.
 mean - Average or mean value.
 median - Median value.
 std - Standard deviation.
 var - Variance.
 sort - Sort in ascending order.
 sortrows - Sort rows in ascending order.
 sum - Sum of elements.
 prod - Product of elements.
 hist - Histogram.
 histc - Histogram count.
 trapz - Trapezoidal numerical integration.
 cumsum - Cumulative sum of elements.
 cumprod - Cumulative product of elements.
 cumtrapz - Cumulative trapezoidal numerical integration.

Finite differences.

diff - Difference and approximate derivative.
 gradient - Approximate gradient.
 del2 - Discrete Laplacian.

Correlation.

corrcoef - Correlation coefficients.
 cov - Covariance matrix.
 subspace - Angle between subspaces.

Filtering and convolution.

filter - One-dimensional digital filter.
 filter2 - Two-dimensional digital filter.
 conv - Convolution and polynomial multiplication.
 conv2 - Two-dimensional convolution.
 convn - N-dimensional convolution.
 deconv - Deconvolution and polynomial division.
 detrend - Linear trend removal.

Fourier transforms.

fft - Discrete Fourier transform.
 fft2 - Two-dimensional discrete Fourier transform.
 fftn - N-dimensional discrete Fourier Transform.
 ifft - Inverse discrete Fourier transform.
 ifft2 - Two-dimensional inverse discrete Fourier transform.
 ifftn - N-dimensional inverse discrete Fourier Transform.
 fftshift - Shift zero-frequency component to center of spectrum.
 ifftshift - Inverse FFTSHIFT.

1.9 Audio support

Audio input/output objects.

audioplayer - Windows audio player object.
 audiorecorder - Windows audio recorder object.

Audio hardware drivers.

sound - Play vector as sound.
 soundsc - Autoscale and play vector as sound.
 wavplay - Play sound using Windows audio output device.
 wavrecord - Record sound using Windows audio input device.

Audio file import and export.

auread - Read NeXT/SUN (".au") sound file.
 auwrite - Write NeXT/SUN (".au") sound file.
 wavread - Read Microsoft WAVE (".wav") sound file.
 wavwrite - Write Microsoft WAVE (".wav") sound file.

Utilities.

lin2mu - Convert linear signal to mu-law encoding.
 mu2lin - Convert mu-law encoding to linear signal.

Example audio data (MAT files).

chirp - Frequency sweeps (1.6 sec, 8192 Hz)
 gong - Gong (5.1 sec, 8192 Hz)
 handel - Hallelujah chorus (8.9 sec, 8192 Hz)
 laughter - Laughter from a crowd (6.4 sec, 8192 Hz)
 splat - Chirp followed by a splat (1.2 sec, 8192 Hz)
 train - Train whistle (1.5 sec, 8192 Hz)

1.10 Interpolation and polynomials

Data interpolation.

pchip - Piecewise cubic Hermite interpolating polynomial.
 interp1 - 1-D interpolation (table lookup).
 interp1q - Quick 1-D linear interpolation.
 interpft - 1-D interpolation using FFT method.
 interp2 - 2-D interpolation (table lookup).
 interp3 - 3-D interpolation (table lookup).
 interpn - N-D interpolation (table lookup).
 griddata - Data gridding and surface fitting.
 griddata3 - Data gridding and hyper-surface fitting for 3-dimensional data.
 griddatan - Data gridding and hyper-surface fitting (dimension ≥ 2).

Spline interpolation.

spline - Cubic spline interpolation.
 ppval - Evaluate piecewise polynomial.

Geometric analysis.

delaunay - Delaunay triangulation.

delaunay3 - 3-D Delaunay tessellation.
 delaunayn - N-D Delaunay tessellation.
 dsearch - Search Delaunay triangulation for nearest point.
 dsearchn - Search N-D Delaunay tessellation for nearest point.
 tsearch - Closest triangle search.
 tsearchn - N-D closest triangle search.
 convhull - Convex hull.
 convhulln - N-D convex hull.
 voronoi - Voronoi diagram.
 voronoin - N-D Voronoi diagram.
 inpolygon - True for points inside polygonal region.
 rectint - Rectangle intersection area.
 polyarea - Area of polygon.

Polynomials.

roots - Find polynomial roots.
 poly - Convert roots to polynomial.
 polyval - Evaluate polynomial.
 polyvalm - Evaluate polynomial with matrix argument.
 residue - Partial-fraction expansion (residues).
 polyfit - Fit polynomial to data.
 polyder - Differentiate polynomial.
 polyint - Integrate polynomial analytically.
 conv - Multiply polynomials.
 deconv - Divide polynomials.

1.11 Function functions and ODE solvers

Optimization and root finding.

fminbnd - Scalar bounded nonlinear function minimization.
 fminsearch - Multidimensional unconstrained nonlinear minimization,
 by Nelder-Mead direct search method.
 fzero - Scalar nonlinear zero finding.

Optimization Option handling

optimset - Create or alter optimization OPTIONS structure.
 optimget - Get optimization parameters from OPTIONS structure.

Numerical integration (quadrature).

quad - Numerically evaluate integral, low order method.
 quadl - Numerically evaluate integral, higher order method.
 dblquad - Numerically evaluate double integral.
 triplequad - Numerically evaluate triple integral.

Plotting.

ezplot - Easy to use function plotter.
 ezplot3 - Easy to use 3-D parametric curve plotter.
 ezpolar - Easy to use polar coordinate plotter.
 ezcontour - Easy to use contour plotter.
 ezcontourf - Easy to use filled contour plotter.
 ezmesh - Easy to use 3-D mesh plotter.

ezmeshc - Easy to use combination mesh/contour plotter.
 ezsurf - Easy to use 3-D colored surface plotter.
 ezsurf c - Easy to use combination surf/contour plotter.
 fplot - Plot function.

Inline function object.

inline - Construct INLINE function object.
 argnames - Argument names.
 formula - Function formula.
 char - Convert INLINE object to character array.

Differential equation solvers.

Initial value problem solvers for ODEs. (If unsure about stiffness, try ODE45 first, then ODE15S.)

ode45 - Solve non-stiff differential equations, medium order method.
 ode23 - Solve non-stiff differential equations, low order method.
 ode113 - Solve non-stiff differential equations, variable order method.
 ode23t - Solve moderately stiff ODEs and DAEs Index 1, trapezoidal rule.
 ode15s - Solve stiff ODEs and DAEs Index 1, variable order method.
 ode23s - Solve stiff differential equations, low order method.
 ode23tb - Solve stiff differential equations, low order method.

Initial value problem solvers for delay differential equations (DDEs).

dde23 - Solve delay differential equations (DDEs) with constant delays.

Boundary value problem solver for ODEs.

bvp4c - Solve two-point boundary value problems for ODEs by collocation.

1D Partial differential equation solver.

pdepe - Solve initial-boundary value problems for parabolic-elliptic PDEs.

Option handling.

odeset - Create/alter ODE OPTIONS structure.
 odeget - Get ODE OPTIONS parameters.
 ddeset - Create/alter DDE OPTIONS structure.
 ddeget - Get DDE OPTIONS parameters.
 bvpset - Create/alter BVP OPTIONS structure.
 bvpget - Get BVP OPTIONS parameters.

Input and Output functions.

deval - Evaluates the solution of a differential equation problem.
 odeplot - Time series ODE output function.
 odephas2 - 2-D phase plane ODE output function.
 odephas3 - 3-D phase plane ODE output function.
 odeprint - Command window printing ODE output function.
 bvpinit - Forms the initial guess for BVP4C.
 pdeval - Evaluates by interpolation the solution computed by PDEPE.
 odefile - MATLAB v5 ODE file syntax (obsolete).

1.12 Sparse matrices

Elementary sparse matrices.

speye - Sparse identity matrix.
 sprand - Sparse uniformly distributed random matrix.
 sprandn - Sparse normally distributed random matrix.
 sprandsym - Sparse random symmetric matrix.
 spdiags - Sparse matrix formed from diagonals.

Full to sparse conversion.

sparse - Create sparse matrix.
 full - Convert sparse matrix to full matrix.
 find - Find indices of nonzero elements.
 spconvert - Import from sparse matrix external format.

Working with sparse matrices.

nnz - Number of nonzero matrix elements.
 nonzeros - Nonzero matrix elements.
 nzmax - Amount of storage allocated for nonzero matrix elements.
 spones - Replace nonzero sparse matrix elements with ones.
 spalloc - Allocate space for sparse matrix.
 issparse - True for sparse matrix.
 spfun - Apply function to nonzero matrix elements.
 spy - Visualize sparsity pattern.

Reordering algorithms.

colamd - Column approximate minimum degree permutation.
 symamd - Symmetric approximate minimum degree permutation.
 colmmd - Column minimum degree permutation.
 symmmd - Symmetric minimum degree permutation.
 symrcm - Symmetric reverse Cuthill-McKee permutation.
 colperm - Column permutation.
 randperm - Random permutation.
 dmperm - Dulmage-Mendelsohn permutation.

Linear algebra.

eigs - A few eigenvalues, using ARPACK.
 svds - A few singular values, using eigs.
 luinc - Incomplete LU factorization.
 cholinc - Incomplete Cholesky factorization.
 normest - Estimate the matrix 2-norm.
 condest - 1-norm condition number estimate.
 sprank - Structural rank.

Linear Equations (iterative methods).

pcg - Preconditioned Conjugate Gradients Method.
 bicg - BiConjugate Gradients Method.
 bicgstab - BiConjugate Gradients Stabilized Method.
 cgs - Conjugate Gradients Squared Method.
 gmres - Generalized Minimum Residual Method.
 lsqr - Conjugate Gradients on the Normal Equations.
 minres - Minimum Residual Method.

qmr - Quasi-Minimal Residual Method.
 symmlq - Symmetric LQ Method.

Operations on graphs (trees).

treelayout - Lay out tree or forest.
 treeplot - Plot picture of tree.
 etree - Elimination tree.
 etreeplot - Plot elimination tree.
 gplot - Plot graph, as in "graph theory".

Miscellaneous.

symbfact - Symbolic factorization analysis.
 spparms - Set parameters for sparse matrix routines.
 spaugment - Form least squares augmented system.

1.13 Two dimensional graphs

Elementary X-Y graphs.

plot - Linear plot.
 loglog - Log-log scale plot.
 semilogx - Semi-log scale plot.
 semilogy - Semi-log scale plot.
 polar - Polar coordinate plot.
 plotyy - Graphs with y tick labels on the left and right.

Axis control.

axis - Control axis scaling and appearance.
 zoom - Zoom in and out on a 2-D plot.
 grid - Grid lines.
 box - Axis box.
 hold - Hold current graph.
 axes - Create axes in arbitrary positions.
 subplot - Create axes in tiled positions.

Graph annotation.

plotedit - Tools for editing and annotating plots.
 legend - Graph legend.
 title - Graph title.
 xlabel - X-axis label.
 ylabel - Y-axis label.
 texlabel - Produces TeX format from a character string
 text - Text annotation.
 gtext - Place text with mouse.

Hardcopy and printing.

print - Print graph or Simulink system; or save graph to M-file.
 printopt - Printer defaults.
 orient - Set paper orientation.

See also GRAPH3D, SPECGRAPH.

1.14 Three dimensional graphs

Elementary 3-D plots.

plot3 - Plot lines and points in 3-D space.
 mesh - 3-D mesh surface.
 surf - 3-D colored surface.
 fill3 - Filled 3-D polygons.

Color control.

colormap - Color look-up table.
 caxis - Pseudocolor axis scaling.
 shading - Color shading mode.
 hidden - Mesh hidden line removal mode.
 brighten - Brighten or darken color map.
 colordef - Set color defaults.
 graymon - Set graphics defaults for gray-scale monitors.

Lighting.

surfl - 3-D shaded surface with lighting.
 lighting - Lighting mode.
 material - Material reflectance mode.
 specular - Specular reflectance.
 diffuse - Diffuse reflectance.
 surfnorm - Surface normals.

Color maps.

hsv - Hue-saturation-value color map.
 hot - Black-red-yellow-white color map.
 gray - Linear gray-scale color map.
 bone - Gray-scale with tinge of blue color map.
 copper - Linear copper-tone color map.
 pink - Pastel shades of pink color map.
 white - All white color map.
 flag - Alternating red, white, blue, and black color map.
 lines - Color map with the line colors.
 colorcube - Enhanced color-cube color map.
 vga - Windows colormap for 16 colors.
 jet - Variant of HSV.
 prism - Prism color map.
 cool - Shades of cyan and magenta color map.
 autumn - Shades of red and yellow color map.
 spring - Shades of magenta and yellow color map.
 winter - Shades of blue and green color map.
 summer - Shades of green and yellow color map.

Transparency.

alpha - Transparency (alpha) mode.
 alphamap - Transparency (alpha) look-up table.
 alim - Transparency (alpha) scaling

Axis control.

axis - Control axis scaling and appearance.

zoom - Zoom in and out on a 2-D plot.
 grid - Grid lines.
 box - Axis box.
 hold - Hold current graph.
 axes - Create axes in arbitrary positions.
 subplot - Create axes in tiled positions.
 daspect - Data aspect ratio.
 pbaspect - Plot box aspect ratio.
 xlim - X limits.
 ylim - Y limits.
 zlim - Z limits.

Viewpoint control.

view - 3-D graph viewpoint specification.
 viewmtx - View transformation matrix.
 rotate3d - Interactively rotate view of 3-D plot.

Camera control.

campos - Camera position.
 camtarget - Camera target.
 camva - Camera view angle.
 camup - Camera up vector.
 camproj - Camera projection.

High level camera control.

camorbit - Orbit camera.
 campan - Pan camera.
 camdolly - Dolly camera.
 camzoom - Zoom camera.
 camroll - Roll camera.
 camlookat - Move camera and target to view specified objects.
 cameratoolbar - Interactively manipulate camera.

High level light control.

camlight - Creates or sets position of a light.
 lightgangle - Spherical position of a light.

Graph annotation.

title - Graph title.
 xlabel - X-axis label.
 ylabel - Y-axis label.
 zlabel - Z-axis label.
 colorbar - Display color bar (color scale).
 text - Text annotation.
 gtext - Mouse placement of text.
 plottedit - Experimental graph editing and annotation tools.

Hardcopy and printing.

print - Print graph or Simulink system; or save graph to M-file.
 printopt - Printer defaults.
 orient - Set paper orientation.
 vrml - Save graphics to VRML 2.0 file.

See also GRAPH2D, SPECGRAPH.

1.15 Specialized graphs

Specialized 2-D graphs.

area - Filled area plot.
 bar - Bar graph.
 barh - Horizontal bar graph.
 comet - Comet-like trajectory.
 compass - Compass plot.
 errorbar - Error bar plot.
 ezplot - Easy to use function plotter.
 ezpolar - Easy to use polar coordinate plotter.
 feather - Feather plot.
 fill - Filled 2-D polygons.
 fplot - Plot function.
 hist - Histogram.
 pareto - Pareto chart.
 pie - Pie chart.
 plotmatrix - Scatter plot matrix.
 rose - Angle histogram plot.
 scatter - Scatter plot.
 stem - Discrete sequence or "stem" plot.
 stairs - Stairstep plot.

Contour and 2-1/2 D graphs.

contour - Contour plot.
 contourf - Filled contour plot.
 contour3 - 3-D Contour plot.
 clabel - Contour plot elevation labels.
 ezcontour - Easy to use contour plotter.
 ezcontourf - Easy to use filled contour plotter.
 pcolor - Pseudocolor (checkerboard) plot.
 voronoi - Voronoi diagram.

Specialized 3-D graphs.

bar3 - 3-D bar graph.
 bar3h - Horizontal 3-D bar graph.
 comet3 - 3-D comet-like trajectories.
 ezgraph3 - General purpose surface plotter.
 ezmesh - Easy to use 3-D mesh plotter.
 ezmeshc - Easy to use combination mesh/contour plotter.
 ezplot3 - Easy to use 3-D parametric curve plotter.
 ezsurf - Easy to use 3-D colored surface plotter.
 ezsurf - Easy to use combination surf/contour plotter.
 meshc - Combination mesh/contour plot.
 meshz - 3-D mesh with curtain.
 pie3 - 3-D pie chart.
 ribbon - Draw 2-D lines as ribbons in 3-D.
 scatter3 - 3-D scatter plot.

stem3 - 3-D stem plot.
 surf - Combination surf/contour plot.
 trisurf - Triangular surface plot.
 trimesh - Triangular mesh plot.
 waterfall - Waterfall plot.

Volume and vector visualization.

vissuite - Visualization suite.
 isosurface - Isosurface extractor.
 isonormals - Isosurface normals.
 isocaps - Isosurface end caps.
 isocolors - Isosurface and patch colors.
 contourslice - Contours in slice planes.
 slice - Volumetric slice plot.
 streamline - Streamlines from 2D or 3D vector data.
 stream3 - 3D streamlines.
 stream2 - 2D streamlines.
 quiver3 - 3D quiver plot.
 quiver - 2D quiver plot.
 divergence - Divergence of a vector field.
 curl - Curl and angular velocity of a vector field.
 coneplot - 3D cone plot.
 streamtube - 3D stream tube.
 streamribbon - 3D stream ribbon.
 streamslice - Streamlines in slice planes.
 streamparticles - Display stream particles.
 interpstreamspeed - Interpolate streamline vertices from speed.
 subvolume - Extract subset of volume dataset.
 reducevolume - Reduce volume dataset.
 volumebounds - Returns x,y,z and color limits for volume data.
 smooth3 - Smooth 3D data.
 reducepatch - Reduce number of patch faces.
 shrinkfaces - Reduce size of patch faces.

Images display and file I/O.

image - Display image.
 imagesc - Scale data and display as image.
 colormap - Color look-up table.
 gray - Linear gray-scale color map.
 contrast - Gray scale color map to enhance image contrast.
 brighten - Brighten or darken color map.
 colorbar - Display color bar (color scale).
 imread - Read image from graphics file.
 imwrite - Write image to graphics file.
 imfinfo - Information about graphics file.
 im2java - Convert image to Java image.

Movies and animation.

capture - Screen capture of current figure.
 moviein - Initialize movie frame memory.
 getframe - Get movie frame.
 movie - Play recorded movie frames.

rotate - Rotate object about specified origin and direction.
 frame2im - Convert movie frame to indexed image.
 im2frame - Convert index image into movie format.

Color related functions.

spinmap - Spin color map.
 rgbplot - Plot color map.
 colstyle - Parse color and style from string.
 ind2rgb - Convert indexed image to RGB image.

Solid modeling.

cylinder - Generate cylinder.
 sphere - Generate sphere.
 ellipsoid - Generate ellipsoid.
 patch - Create patch.
 surf2patch - Convert surface data to patch data.

See also GRAPH2D, GRAPH3D.

1.16 Handle Graphics

Handle Graphics objects.

figure - Create figure window.
 axes - Create axes.
 line - Create line.
 text - Create text.
 patch - Create patch.
 rectangle - Create rectangle, rounded-rectangle, or ellipse.
 surface - Create surface.
 image - Create image.
 light - Create light.
 uicontrol - Create user interface control.
 uimenu - Create user interface menu.
 uicontextmenu - Create user interface context menu.

Handle Graphics operations.

set - Set object properties.
 get - Get object properties.
 reset - Reset object properties.
 delete - Delete object.
 gco - Get handle to current object.
 gcbo - Get handle to current callback object.
 gcbf - Get handle to current callback figure.
 drawnow - Flush pending graphics events.
 findobj - Find objects with specified property values.
 copyobj - Make copy of graphics object and its children.
 isappdata - Check if application-defined data exists.
 getappdata - Get value of application-defined data.
 setappdata - Set application-defined data.
 rmappdata - Remove application-defined data.

Hardcopy and printing.

print - Print graph or Simulink system; or save graph to M-file.
 printopt - Printer defaults.
 orient - Set paper orientation.

Utilities.

closereq - Figure close request function.
 newplot - M-file preamble for NextPlot property.
 ishandle - True for graphics handles.

ActiveX Client Functions (PC Only).

actxcontrol - Create an ActiveX control.
 actxserver - Create an ActiveX server.

See also GRAPH2D, GRAPH3D, SPECGRAPH, WINFUN.

1.17 Graphical user interface tools

GUI functions.

uicontrol - Create user interface control.
 uimenu - Create user interface menu.
 ginput - Graphical input from mouse.
 dragrect - Drag XOR rectangles with mouse.
 rbbox - Rubberband box.
 selectmoveresize - Interactively select, move, resize, or copy objects.
 waitforbuttonpress - Wait for key/buttonpress over figure.
 waitfor - Block execution and wait for event.
 uiwait - Block execution and wait for resume.
 uiresume - Resume execution of blocked M-file.
 uistack - Control stacking order of objects.
 uisuspend - Suspend the interactive state of a figure.
 uirestore - Restore the interactive state of a figure.

GUI design tools.

guide - Design GUI.
 inspect - Inspect object properties.
 align - Align uicontrols and axes.
 propedit - Edit property.

Dialog boxes.

axlimdlg - Axes limits dialog box.
 dialog - Create dialog figure.
 errorldg - Error dialog box.
 helpdlg - Help dialog box.
 imageview - Show image in figure with zoom.
 inputdlg - Input dialog box.
 listdlg - List selection dialog box.
 menu - Generate menu of choices for user input.
 movieview - Show movie in figure with replay button.
 msgbox - Message box.
 pagedlg - Page position dialog box.

pagesetupdlg - Page setup dialog.
 printdlg - Print dialog box.
 printpreview - Display preview of figure to be printed.
 questdlg - Question dialog box.
 soundview - Show sound in figure and play.
 uigetpref - Question dialog box with preference support.
 uigetfile - Standard open file dialog box.
 uiputfile - Standard save file dialog box.
 uigetdir - Standard open directory dialog box.
 uisetcolor - Color selection dialog box.
 uisetfont - Font selection dialog box.
 uiopen - Show open file dialog and call OPEN on result.
 uisave - Show open file dialog and call SAVE on result.
 uiload - Show open file dialog and call LOAD on result.
 uiimport - Start the GUI for importing data (Import Wizard).
 waitbar - Display wait bar.
 warndlg - Warning dialog box.

Menu utilities.

makemenu - Create menu structure.
 menubar - Computer dependent default setting for MenuBar property.
 umtoggle - Toggle "checked" status of uimenu object.
 winmenu - Create submenu for "Window" menu item.

Toolbar button group utilities.

btngroup - Create toolbar button group.
 btnresize - Resize button group.
 btnstate - Query state of toolbar button group.
 btnpress - Button press manager for toolbar button group.
 btndown - Depress button in toolbar button group.
 btnup - Raise button in toolbar button group.

Preferences.

addpref - Add preference.
 getpref - Get preference.
 rmpref - Remove preference.
 setpref - Set preference.
 ispref - Test for existence of preference.

Miscellaneous utilities.

allchild - Get all object children.
 clipboard - Copy and Paste strings to and from system clipboard.
 edtext - Interactive editing of axes text objects.
 findall - Find all objects.
 findfigs - Find figures positioned off screen.
 getptr - Get figure pointer.
 getstatus - Get status text string in figure.
 hidegui - Hide/unhide GUI.
 listfonts - Get list of available system fonts in cell array.
 movegui - Move GUI to specified part of screen.
 guihandles - Return a structure of handles.
 guidata - Store or retrieve application data.

overobj - Get handle of object the pointer is over.
 popupstr - Get popup menu selection string.
 remapfig - Transform figure objects' positions.
 setptr - Set figure pointer.
 setstatus - Set status text string in figure.
 uiclearmode - Clears the currently active interactive mode.

1.18 Character strings

General.

char - Create character array (string).
 double - Convert string to numeric character codes.
 cellstr - Create cell array of strings from character array.
 blanks - String of blanks.
 deblank - Remove trailing blanks.
 eval - Execute string with MATLAB expression.

String tests.

ischar - True for character array (string).
 iscellstr - True for cell array of strings.
 isletter - True for letters of the alphabet.
 isspace - True for white space characters.

String operations.

regexp - Regular expression matching.
 regexp_i - Regular expression matching ignoring case.
 regexprep - Regular expression replacing.
 strcat - Concatenate strings.
 strvcats - Vertically concatenate strings.
 strcmp - Compare strings.
 strncmp - Compare first N characters of strings.
 strcmp_i - Compare strings ignoring case.
 strncmp_i - Compare first N characters of strings ignoring case.
 findstr - Find shorter string pattern within longer string.
 strfind - Find second string pattern within first string.
 strjust - Justify character array.
 strmatch - Find possible matches for string.
 strrep - Replace string with another.
 strtok - Find token in string.
 upper - Convert string to uppercase.
 lower - Convert string to lowercase.

String to number conversion.

num2str - Convert number to string.
 int2str - Convert integer to string.
 mat2str - Convert matrix to eval'able string.
 str2double - Convert string to double precision value.
 str2num - Convert string matrix to numeric array.
 sprintf - Write formatted data to string.
 sscanf - Read string under format control.

Base number conversion.

hex2num - Convert IEEE hexadecimal to double precision number.
 hex2dec - Convert hexadecimal string to decimal integer.
 dec2hex - Convert decimal integer to hexadecimal string.
 bin2dec - Convert binary string to decimal integer.
 dec2bin - Convert decimal integer to binary string.
 base2dec - Convert base B string to decimal integer.
 dec2base - Convert decimal integer to base B string.

See also STRINGS.

1.19 File input/output

File import/export functions.

dlmread - Read delimited text file.
 dlmwrite - Write delimited text file.
 load - Load workspace from MATLAB (MAT) file.
 importdata - Load workspace variables disk file.
 wklread - Read spreadsheet (WK1) file.
 wklwrite - Write spreadsheet (WK1) file.
 xlsread - Read spreadsheet (XLS) file.

Image file import/export.

imfinfo - Return information about graphics file.
 imread - Read image from graphics file.
 imwrite - Write image to graphics file.
 im2java - Convert image to Java image.

Internet resource.

urlread - Read the contents of a URL into a string.
 urlwrite - Write the contents of a URL to a local file.
 sendmail - Send e-mail.

Zip file access.

zip - Compress files into a zip file.
 unzip - Extract the contents of a zip file.

Audio file import/export.

auread - Read NeXT/SUN (AU) sound file.
 auwrite - Write NeXT/SUN (AU) sound file.
 wavread - Read Microsoft WAVE (WAV) sound file.
 wavwrite - Write Microsoft WAVE (WAV) sound file.

Video file import/export.

aviread - Read movie (AVI) file.
 aviinfo - Return information about AVI file.
 avifile - Create a new AVI file.
 movie2avi - Create AVI movie from MATLAB movie.

Formatted file I/O.

fgetl - Read line from file, discard newline character.

fgets - Read line from file, keep newline character.
 fprintf - Write formatted data to file.
 fscanf - Read formatted data from file.
 input - Prompt for user input.
 textread - Read formatted data from text file.

String conversion.

sprintf - Write formatted data to string.
 sscanf - Read string under format control.
 stread - Read formatted data from text string.

File opening and closing.

fopen - Open file.
 fclose - Close file.

Binary file I/O.

fread - Read binary data from file.
 fwrite - Write binary data to file.

File positioning.

feof - Test for end-of-file.
 ferror - Inquire file error status.
 frewind - Rewind file.
 fseek - Set file position indicator.
 ftell - Get file position indicator.

File name handling

fileparts - Filename parts.
 filesep - Directory separator for this platform.
 fullfile - Build full filename from parts.
 matlabroot - Root directory of MATLAB installation.
 mexext - MEX filename extension for this platform.
 partialpath - Partial pathnames.
 pathsep - Path separator for this platform.
 prefdir - Preference directory name.
 tempdir - Get temporary directory.
 tempname - Get temporary file.

CDF file handling

cdfread - Read data from a CDF file.
 cdfinfo - Get information from a CDF file.
 cdfwrite - Write data to a CDF file.
 cdfepoch - Construct cdfepoch object.

HDF library interface help.

hdf - MEX-file interface to the HDF library.
 hdfan - MATLAB Gateway to HDF multifile annotation interface.
 hdfdf24 - MATLAB Gateway to HDF raster image interface.
 hdfdfr8 - MATLAB Gateway to HDF 8-bit raster image interface.
 hdfh - MATLAB Gateway to HDF H interface.
 hdfhd - MATLAB Gateway to HDF HD interface.
 hdfhe - MATLAB Gateway to HDF HE interface.

hdfml - MATLAB-HDF gateway utilities.
 hdfsd - MATLAB Gateway to HDF multifile scientific dataset interface.
 hdfv - MATLAB Gateway to HDF V (Vgroup) interface.
 hdfvfv - MATLAB Gateway to HDF VF (Vdata) interface.
 hdfvh - MATLAB Gateway to HDF VH (Vdata) interface.
 hdfvsv - MATLAB Gateway to HDF VS (Vdata) interface.

HDF-EOS library interface help.

hdfgd - MATLAB Gateway to HDF-EOS grid interface.
 hdfpt - MATLAB Gateway to HDF-EOS point interface.
 hdfsw - MATLAB Gateway to HDF-EOS swath interface.

XML file handling

xmlread - Parse an XML file and return a Document Object Model node.
 xmlwrite - Serialize an XML Document Object Model node.
 xslt - Transform an XML document using an XSLT engine.

Serial port support.

serial - Construct serial port object.

Timer support.

timer - Construct timer object.

Command window I/O

clc - Clear command window.
 disp - Display array.
 home - Send cursor home.
 input - Prompt for user input.
 pause - Wait for user response.

FIG file support for plotedit and printframes.

hgload - Loads a Handle Graphics object from a file.
 hgsave - Saves an HG object hierarchy to a file.

Utilities.

str2rng - Convert spreadsheet range string to numeric array.
 wklconst - WK1 record type definitions.
 wklwrec - Write a WK1 record header.

1.20 Time and dates

Current date and time.

now - Current date and time as date number.
 date - Current date as date string.
 clock - Current date and time as date vector.

Basic functions.

datenum - Serial date number.
 datestr - String representation of date.
 datevec - Date components.

Date functions.

calendar - Calendar.
 weekday - Day of week.
 eomday - End of month.
 datetick - Date formatted tick labels.

Timing functions.

cputime - CPU time in seconds.
 tic - Start stopwatch timer.
 toc - Stop stopwatch timer.
 etime - Elapsed time.
 pause - Wait in seconds.

1.21 Data types and structures

Data types (classes)

double - Convert to double precision.
 sparse - Create sparse matrix.
 char - Create character array (string).
 cell - Create cell array.
 struct - Create or convert to structure array.
 single - Convert to single precision.
 uint8 - Convert to unsigned 8-bit integer.
 uint16 - Convert to unsigned 16-bit integer.
 uint32 - Convert to unsigned 32-bit integer.
 uint64 - Convert to unsigned 64-bit integer.
 int8 - Convert to signed 8-bit integer.
 int16 - Convert to signed 16-bit integer.
 int32 - Convert to signed 32-bit integer.
 int64 - Convert to signed 64-bit integer.
 inline - Construct INLINE object.
 function_handle - Function handle array.
 javaArray - Construct a Java array.
 javaMethod - Invoke a Java method.
 javaObject - Invoke a Java object constructor.

Multi-dimensional array functions.

cat - Concatenate arrays.
 ndims - Number of dimensions.
 ndgrid - Generate arrays for N-D functions and interpolation.
 permute - Permute array dimensions.
 ipermute - Inverse permute array dimensions.
 shiftdim - Shift dimensions.
 squeeze - Remove singleton dimensions.

Cell array functions.

cell - Create cell array.
 cellfun - Functions on cell array contents.
 celldisp - Display cell array contents.
 cellplot - Display graphical depiction of cell array.
 cell2mat - Combine cell array of matrices into one matrix.

mat2cell - Break matrix up into cell array of matrices.
 num2cell - Convert numeric array into cell array.
 deal - Deal inputs to outputs.
 cell2struct - Convert cell array into structure array.
 struct2cell - Convert structure array into cell array.
 iscell - True for cell array.

Structure functions.

struct - Create or convert to structure array.
 fieldnames - Get structure field names.
 getfield - Get structure field contents.
 setfield - Set structure field contents.
 rmfield - Remove structure field.
 isfield - True if field is in structure array.
 isstruct - True for structures.
 orderfields - Order fields of a structure array.

Function handle functions.

@ - Create function_handle.
 func2str - Convert function_handle array into string.
 str2func - Convert string into function_handle array.
 functions - List functions associated with a function_handle.

Object oriented programming functions.

class - Create object or return object class.
 struct - Convert object to structure array.
 methods - List names and properties of class methods.
 methodsview - View names and properties of class methods.
 isa - True if object is a given class.
 isjava - True for Java objects.
 isobject - True for MATLAB objects.
 inferiorito - Inferior class relationship.
 superiorito - Superior class relationship.
 substruct - Create structure argument for SUBSREF/SUBSASGN.

Overloadable operators.

minus - Overloadable method for a-b.
 plus - Overloadable method for a+b.
 times - Overloadable method for a.*b.
 mtimes - Overloadable method for a*b.
 mldivide - Overloadable method for a\b.
 mrdivide - Overloadable method for a/b.
 rdivide - Overloadable method for a./b.
 ldivide - Overloadable method for a.\b.
 power - Overloadable method for a.^b.
 mpower - Overloadable method for a^b.
 uminus - Overloadable method for -a.
 uplus - Overloadable method for +a.
 horzcat - Overloadable method for [a b].
 vertcat - Overloadable method for [a;b].
 le - Overloadable method for a<=b.
 lt - Overloadable method for a<b.

gt - Overloadable method for a>b.
 ge - Overloadable method for a>=b.
 eq - Overloadable method for a==b.
 ne - Overloadable method for a~=b.
 not - Overloadable method for ~a.
 and - Overloadable method for a&b.
 or - Overloadable method for a|b.
 subsasgn - Overloadable method for a(i)=b, a{i}=b, and a.field=b.
 subsref - Overloadable method for a(i), a{i}, and a.field.
 colon - Overloadable method for a:b.
 end - Overloadable method for a(end)
 transpose - Overloadable method for a.'
 ctranspose - Overloadable method for a'
 subsindex - Overloadable method for x(a).
 loadobj - Called when loading an object from a .MAT file.
 saveobj - Called with saving an object to a .MAT file.

1.22 Version control

Version control commands.

checkin - checkin files into a version control system.
 checkout - checkout files from a version control system.
 undockout - undo checkout files from a version control system.

Specific version control.

rscs - Version control actions using RCS.
 pvcs - Version control actions using PVCS.
 clearcase - Version control actions using ClearCase.
 sourcesafe - Version control actions using Visual SourceSafe.
 customverctrl - Custom version control template.

1.23 Windows Operating System Interface Files (DDE/COM)

COM Automation Client Functions.

winfun\comcli - COM class functions.

DDE Client Functions.

ddeadv - Set up advisory link.
 ddeexec - Send string for execution.
 ddeinit - Initiate DDE conversation.
 ddpoke - Send data to application.
 ddereq - Request data from application.
 ddeterm - Terminate DDE conversation.
 ddeunadv - Release advisory link.

Other

winopen - Open a file using the appropriate Windows command.
 winqueryreg - Get information from the Windows registry.

1.24 Examples and demonstrations

Type 'demo' at the command line to browse more demos of MATLAB, the Toolboxes, and Simulink.

MATLAB/Introduction.

demo - Browse demos for MATLAB, Toolboxes, and Simulink

MATLAB/Matrices.

intro - Introduction to basic matrix operations in MATLAB.
 invertem - Demonstrate the inversion of a matrix.
 buckydem - Connectivity graph of the Buckminster Fuller geodesic dome.
 sparsity - Demonstrate effect of sparsity orderings.
 matmanip - Introduction to matrix manipulation.
 eigmovie - Symmetric eigenvalue movie.
 rrefmovie - Computation of Reduced Row Echelon Form.
 delsqdemo - Finite difference Laplacian on various domains.
 sepdemo - Separators for a finite element mesh.
 airfoil - Display sparse matrix from NASA airfoil.
 eigshow - Graphical demonstration of matrix eigenvalues.
 svdshow - Graphical demonstration of matrix singular values.

MATLAB/Numerics.

funfuns - Demonstrate functions that operate on other functions.
 fitdemo - Nonlinear curve fit with simplex algorithm.
 sunspots - FFT: the answer is 11.08, what is the question?
 e2pi - 2D visual solutions: Which is greater, e^{π} or π^e ?
 bench - MATLAB Benchmark.
 fftdemo - Use of the fast finite Fourier transform.
 census - Try to predict the US population in the year 2000.
 spline2d - Demonstrate GINPUT and SPLINE in two dimensions.
 lotkadem - An example of ordinary differential equation solution.
 quaddemo - Adaptive quadrature.
 zerodemo - Zerofinding with fzero.
 fplotdemo - Plot a function.
 quake - Loma Prieta Earthquake.
 qhulldemo - Tessellation and interpolation of scattered data.
 expm1 - Matrix exponential via Pade approximation.
 expm2 - Matrix exponential via Taylor series.
 expm3 - Matrix exponential via eigenvalues and eigenvectors.

MATLAB/Visualization.

graf2d - 2D Plots: Demonstrate XY plots in MATLAB.
 graf2d2 - 3D Plots: Demonstrate XYZ plots in MATLAB.
 grafcp1x - Demonstrate complex function plots in MATLAB.
 lorenz - Plot the orbit around the Lorenz chaotic attractor.
 imageext - Image colormaps: changing and rotating colormaps.
 xpklein - Klein bottle demo.
 vibes - Vibration movie: Vibrating L-shaped membrane.
 xpsound - Visualizing sound: Demonstrate MATLAB's sound capability.
 imagedemo - Demonstrate MATLAB's image capability.

penny - Several views of the penny data.
 earthmap - View Earth's topography.
 xfourier - Graphic demo of Fourier series expansion.
 colormenu - Select color map.
 cplxdemo - Maps of functions of a complex variable.

MATLAB/Language.

xplang - Introduction to the MATLAB language.
 hndlgraf - Demonstrate Handle Graphics for line plots.
 graf3d - Demonstrate Handle Graphics for surface plots.
 hndlaxis - Demonstrate Handle Graphics for axes.

MATLAB/Differential equations.

odedemo - Demo for the MATLAB Differential Equation solvers.
 odeexamples - Browse the MATLAB ODE/DAE/BVP/PDE examples.

MATLAB/ODEs

ballode - Demo of a bouncing ball.
 brussode - Stiff problem modelling a chemical reaction (Brusselator).
 burgersode - Burger's equation solved using a moving mesh technique.
 fem1ode - Stiff problem with a time-dependent mass matrix.
 fem2ode - Stiff problem with a constant mass matrix.
 hb1ode - Stiff problem 1 of Hindmarsh and Byrne.
 orbitode - Restricted three body problem.
 rigidode - Euler equations of a rigid body without external forces.
 vdpode - Parameterizable van der Pol equation (stiff for large mu).

MATLAB/DAEs

hb1dae - Stiff DAE from a conservation law.
 amp1dae - Stiff DAE from an electrical circuit.

MATLAB/DDEs

ddex1 - Example 1 for DDE23
 ddex2 - Example 2 for DDE23

MATLAB/BVPs

twobvp - BVP that has exactly two solutions.
 mat4bvp - Find the fourth eigenvalue of the Mathieu's equation.
 shockbvp - The solution has a shock layer near $x = 0$.
 fsbvp - Falkner-Skan BVP on an infinite interval.
 emdenbvp - Emden's equation - BVP with a singular term.

MATLAB/PDEs

pdex1 - Example 1 for PDEPE
 pdex2 - Example 2 for PDEPE
 pdex3 - Example 3 for PDEPE
 pdex4 - Example 4 for PDEPE
 pdex5 - Example 5 for PDEPE

Extras/Gallery.

knot - Tube surrounding a three-dimensional knot.
 quivdemo - Demonstrate the quiver function.
 klein1 - Construct a Klein bottle.
 cruller - Construct cruller.
 tori4 - Hoops: Construct four linked tori.
 spharm2 - Construct spherical surface harmonic.
 modes - Plot 12 modes of the L-shaped membrane.

logo - Display the MATLAB L-shaped membrane logo.

Extras/Games.

fifteen - Sliding puzzle.
 xpbombs - Minesweeper game.
 life - Conway's Game of Life.
 soma - Soma cube.

Extras/Miscellaneous.

truss - Animation of a bending bridge truss.
 travel - Traveling salesman problem.
 spinner - Colorful lines spinning through space.
 xpquad - Superquadrics plotting demonstration.
 codec - Alphabet transposition coder/decoder.
 xphide - Visual perception of objects in motion.
 makevase - Generate and plot a surface of revolution.
 wrldtrv - Great circle flight routes around the globe.
 logospin - Movie of the MATLAB logo spinning.
 crulspin - Spinning cruller movie.
 quatdemo - Quaternion rotation.
 chaingui - Matrix chain multiplication optimization.

General Demo/Helper functions.

cmdlnwin - Demo gateway routine for playing command line demos.
 cmdlnbgn - Set up for command line demos.
 cmdlnend - Clean up after command line demos.
 finddemo - Find demos available for individual toolboxes.
 pltmat - Display a matrix in a figure window.

MATLAB/Helper functions.

bucky - The graph of the Buckminster Fuller geodesic dome.
 peaks - A sample function of two variables.
 membrane - Generates the MATLAB logo.

See also SIMDEMOS

2. SIGNAL PROCESSING TOOLBOX

Filter analysis.

abs - Magnitude.
 angle - Phase angle.
 filternorm - Compute the 2-norm or inf-norm of a digital filter.
 freqs - Laplace transform frequency response.
 freqspace - Frequency spacing for frequency response.
 freqz - Z-transform frequency response.
 fvtool - Filter Visualization Tool.
 grpdelay - Group delay.
 impz - Discrete impulse response.
 phasez - Digital filter phase response.
 phasedelay - Phase delay of a digital filter.
 unwrap - Unwrap phase.
 zerophase - Zero-phase response of a real filter.
 zplane - Discrete pole-zero plot.

Filter implementation.

conv - Convolution.
 conv2 - 2-D convolution.
 convmtx - Convolution matrix.
 deconv - Deconvolution.
 fftfilt - Overlap-add filter implementation.
 filter - Filter implementation.
 filter2 - Two-dimensional digital filtering.
 filtfilt - Zero-phase version of filter.
 filtic - Determine filter initial conditions.
 latcfilt - Lattice filter implementation.
 medfilt1 - 1-Dimensional median filtering.
 sgolayfilt - Savitzky-Golay filter implementation.
 sosfilt - Second-order sections (biquad) filter implementation.
 upfirdn - Up sample, FIR filter, down sample.

Discrete-time filter object.

dfilt - Construct a discrete-time, filter object.
 (Type "doc dfilt" for more information)

FIR filter design.

cremez - Complex and nonlinear phase equiripple FIR filter design.
 fir1 - Window based FIR filter design - low, high, band, stop, multi.
 fir2 - FIR arbitrary shape filter design using the frequency sampling method.
 fircls - Constrained Least Squares filter design - arbitrary response.
 fircls1 - Constrained Least Squares FIR filter design - low and highpass.
 firgauss - FIR Gaussian digital filter design.
 firls - Optimal least-squares FIR filter design.
 firrcos - Raised cosine FIR filter design.
 intfilt - Interpolation FIR filter design.
 kaiserord - Kaiser window design based filter order estimation.
 remez - Optimal Chebyshev-norm FIR filter design.

remezord - Remez design based filter order estimation.
 sgolay - Savitzky-Golay FIR smoothing filter design.

IIR digital filter design.

butter - Butterworth filter design.
 cheby1 - Chebyshev Type I filter design (passband ripple).
 cheby2 - Chebyshev Type II filter design (stopband ripple).
 ellip - Elliptic filter design.
 maxflat - Generalized Butterworth lowpass filter design.
 yulewalk - Yule-Walker filter design.

IIR filter order estimation.

buttord - Butterworth filter order estimation.
 cheblord - Chebyshev Type I filter order estimation.
 cheb2ord - Chebyshev Type II filter order estimation.
 ellipord - Elliptic filter order estimation.

Analog lowpass filter prototypes.

besselap - Bessel filter prototype.
 buttap - Butterworth filter prototype.
 cheblap - Chebyshev Type I filter prototype (passband ripple).
 cheb2ap - Chebyshev Type II filter prototype (stopband ripple).
 ellipap - Elliptic filter prototype.

Analog filter design.

besself - Bessel analog filter design.
 butter - Butterworth filter design.
 cheby1 - Chebyshev Type I filter design.
 cheby2 - Chebyshev Type II filter design.
 ellip - Elliptic filter design.

Analog filter transformation.

lp2bp - Lowpass to bandpass analog filter transformation.
 lp2bs - Lowpass to bandstop analog filter transformation.
 lp2hp - Lowpass to highpass analog filter transformation.
 lp2lp - Lowpass to lowpass analog filter transformation.

Filter discretization.

bilinear - Bilinear transformation with optional prewarping.
 impinvar - Impulse invariance analog to digital conversion.

Linear system transformations.

latc2tf - Lattice or lattice ladder to transfer function conversion.
 polystab - Polynomial stabilization.
 polyscale - Scale roots of polynomial.
 residuez - Z-transform partial fraction expansion.
 sos2ss - Second-order sections to state-space conversion.
 sos2tf - Second-order sections to transfer function conversion.
 sos2zp - Second-order sections to zero-pole conversion.
 ss2sos - State-space to second-order sections conversion.
 ss2tf - State-space to transfer function conversion.
 ss2zp - State-space to zero-pole conversion.

tf2latc - Transfer function to lattice or lattice ladder conversion.
 tf2sos - Transfer Function to second-order sections conversion.
 tf2ss - Transfer function to state-space conversion.
 tf2zpk - Discrete-time transfer function to zero-pole conversion.
 zp2sos - Zero-pole to second-order sections conversion.
 zp2ss - Zero-pole to state-space conversion.
 zp2tf - Zero-pole to transfer function conversion.

Windows.

bartlett - Bartlett window.
 barthannwin - Modified Bartlett-Hanning window.
 blackman - Blackman window.
 blackmanharris - Minimum 4-term Blackman-Harris window.
 bohmanwin - Bohman window.
 chebwin - Chebyshev window.
 flattopwin - Flat Top window.
 gausswin - Gaussian window.
 hamming - Hamming window.
 hann - Hann window.
 kaiser - Kaiser window.
 nuttallwin - Nuttall defined minimum 4-term Blackman-Harris window.
 parzenwin - Parzen (de la Valle-Poussin) window.
 rectwin - Rectangular window.
 triang - Triangular window.
 tukeywin - Tukey window.
 wvtool - Window Visualization Tool.
 window - Window function gateway.

Window object.

sigwin - Construct a window object.
 (Type "doc sigwin" for more information)

Transforms.

bitrevorder - Permute input into bit-reversed order.
 czt - Chirp-z transform.
 dct - Discrete cosine transform.
 dftmtx - Discrete Fourier transform matrix.
 digitrevorder - Permute input into digit-reversed order.
 fft - Fast Fourier transform.
 fft2 - 2-D fast Fourier transform.
 fftshift - Swap vector halves.
 goertzel - Second-order Goertzel algorithm.
 hilbert - Discrete-time analytic signal via Hilbert transform.
 idct - Inverse discrete cosine transform.
 ifft - Inverse fast Fourier transform.
 ifft2 - Inverse 2-D fast Fourier transform.

Cepstral analysis.

cceps - Complex cepstrum.
 icceps - Inverse Complex cepstrum.
 rceps - Real cepstrum and minimum phase reconstruction.

Statistical signal processing and spectral analysis.

- cohere - Coherence function estimate.
- corrcoef - Correlation coefficients.
- corrmtx - Autocorrelation matrix.
- cov - Covariance matrix.
- csd - Cross Spectral Density.
- pburg - Power Spectral Density estimate via Burg's method.
- pcov - Power Spectral Density estimate via the Covariance method.
- peig - Power Spectral Density estimate via the Eigenvector method.
- periodogram - Power Spectral Density estimate via the periodogram method.
- pmcov method. - Power Spectral Density estimate via the Modified Covariance method.
- pmtm method. - Power Spectral Density estimate via the Thomson multitaper method.
- pmusic - Power Spectral Density estimate via the MUSIC method.
- psdplot - Plot Power Spectral Density data.
- pwelch - Power Spectral Density estimate via Welch's method.
- pyulear - Power Spectral Density estimate via the Yule-Walker AR Method.
- rooteig algorithm. - Sinusoid frequency and power estimation via the eigenvector algorithm.
- rootmusic algorithm. - Sinusoid frequency and power estimation via the MUSIC algorithm.
- tfe - Transfer function estimate.
- xcorr - Cross-correlation function.
- xcorr2 - 2-D cross-correlation.
- xcov - Covariance function.

Parametric modeling.

- arburg - AR parametric modeling via Burg's method.
- arcov - AR parametric modeling via covariance method.
- armcov - AR parametric modeling via modified covariance method.
- aryule - AR parametric modeling via the Yule-Walker method.
- ident - See the System Identification Toolbox.
- invfreqs - Analog filter fit to frequency response.
- invfreqz - Discrete filter fit to frequency response.
- prony - Prony's discrete filter fit to time response.
- stmcb - Steiglitz-McBride iteration for ARMA modeling.

Linear Prediction.

- ac2rc conversion. - Autocorrelation sequence to reflection coefficients conversion.
- ac2poly - Autocorrelation sequence to prediction polynomial conversion.
- is2rc - Inverse sine parameters to reflection coefficients conversion.
- lar2rc - Log area ratios to reflection coefficients conversion.
- levinson - Levinson-Durbin recursion.
- lpc - Linear Predictive Coefficients using autocorrelation method.
- lsf2poly - Line spectral frequencies to prediction polynomial conversion.
- poly2ac - Prediction polynomial to autocorrelation sequence conversion.
- poly2lsf - Prediction polynomial to line spectral frequencies conversion.
- poly2rc - Prediction polynomial to reflection coefficients conversion.
- rc2ac conversion. - Reflection coefficients to autocorrelation sequence conversion.
- rc2is - Reflection coefficients to inverse sine parameters conversion.
- rc2lar - Reflection coefficients to log area ratios conversion.

- rc2poly - Reflection coefficients to prediction polynomial conversion.
- rlevinson - Reverse Levinson-Durbin recursion.
- schurrc - Schur algorithm.

Multirate signal processing.

- decimate - Resample data at a lower sample rate.
- downsample - Downsample input signal.
- interp - Resample data at a higher sample rate.
- interp1 - General 1-D interpolation. (MATLAB Toolbox)
- resample - Resample sequence with new sampling rate.
- spline - Cubic spline interpolation.
- upfirdn - Up sample, FIR filter, down sample.
- upsample - Upsample input signal.

Waveform generation.

- chirp - Swept-frequency cosine generator.
- diric - Dirichlet (periodic sinc) function.
- gauspuls - Gaussian RF pulse generator.
- gmonopuls - Gaussian monopulse generator.
- pulstran - Pulse train generator.
- rectpuls - Sampled aperiodic rectangle generator.
- sawtooth - Sawtooth function.
- sinc - Sinc or $\sin(\pi*x)/(\pi*x)$ function
- square - Square wave function.
- tripuls - Sampled aperiodic triangle generator.
- vco - Voltage controlled oscillator.

Specialized operations.

- buffer - Buffer a signal vector into a matrix of data frames.
- cell2sos - Convert cell array to second-order-section matrix.
- cplxpair - Order vector into complex conjugate pairs.
- demod - Demodulation for communications simulation.
- dpss - Discrete prolate spheroidal sequences (Slepian sequences).
- dpsscldir - Remove discrete prolate spheroidal sequences from database.
- dpssload - Load discrete prolate spheroidal sequences from database.
- dpsssave - Save discrete prolate spheroidal sequences in database.
- eqtflength - Equalize the length of a discrete-time transfer function.
- modulate - Modulation for communications simulation.
- seqperiod - Find minimum-length repeating sequence in a vector.
- sos2cell - Convert second-order-section matrix to cell array.
- specgram - Spectrogram, for speech signals.
- stem - Plot discrete data sequence.
- strips - Strip plot.
- udocode - Uniform decoding of the input.
- uencode - Uniform quantization and encoding of the input into N-bits.

Graphical User Interfaces

- fdatool - Filter Design and Analysis Tool.
- fvtool - Filter Visualization Tool.
- sptool - Signal Processing Tool.
- wintool - Window Design and Analysis Tool.

wvtool - Window Visualization Tool.

See also SIGDEMOS, AUDIO, and, in the Filter Design Toolbox, FILTERDESIGN.

3. SIMULINK

3.1 Simulink

Model analysis and construction functions.

Simulation

sim - Simulate a Simulink model.
 sldebug - Debug a Simulink model.
 simset - Define options to SIM Options structure.
 simget - Get SIM Options structure

Linearization and trimming.

linmod - Extract linear model from continuous-time system.
 linmod2 - Extract linear model, advanced method.
 dlinmod - Extract linear model from discrete-time system.
 trim - Find steady-state operating point.

Model Construction.

close_system - Close open model or block.
 new_system - Create new empty model window.
 open_system - Open existing model or block.
 load_system - Load existing model without making model visible.
 save_system - Save an open model.
 add_block - Add new block.
 add_line - Add new line.
 delete_block - Remove block.
 delete_line - Remove line.
 find_system - Search a model.
 hilite_system - Hilite objects within a model.
 replace_block - Replace existing blocks with a new block.
 set_param - Set parameter values for model or block.
 get_param - Get simulation parameter values from model.
 add_param - Add a user-defined string parameter to a model.
 delete_param - Delete a user-defined parameter from a model.
 bdclose - Close a Simulink window.
 bdroot - Root level model name.
 gcb - Get the name of the current block.
 gcbh - Get the handle of the current block.
 gcs - Get the name of the current system.
 getfullname - get the full path name of a block
 slupdate - Update older 1.x models to 3.x.
 addterms - Add terminators to unconnected ports.
 boolean - Convert numeric array to boolean.
 slhelp - Simulink user's guide or block help.

Masking.

hasmask - Check for mask.
 hasmaskdlg - Check for mask dialog.
 hasmaskicon - Check for mask icon.
 iconedit - Design block icons using ginput function.

maskpopups - Return and change masked block's popup menu items.
 movemask - Restructure masked built-in blocks as masked subsystems.

Library.

libinfo - Get library information for a system.

Diagnostics.

sllastdiagnostic - Last diagnostic array.
 sllasterror - Last error array.
 sllastwarning - Last warning array.
 sldiagnostics - Get block count and compile stats for a model.

Hardcopy and printing.

frameedit - Edit print frames for annotated model printouts.
 print - Print graph or Simulink system; or save graph to M-file.
 printopt - Printer defaults.
 orient - Set paper orientation.

See also BLOCKS and SIMDEMOS.

3.2 Simulink block library

Block libraries.

simulink - Open main block library.
 simulink_extras - Simulink Extras block library.

Example S-function models and blocks.

simo - simo model, block diagram form.
 simom - simo model, M-file form.
 simom2 - simo model, M-file form #2.
 simosys - simo model, S-function block form.
 vdpm - Van der Pol model, M-file form.
 mixed - Mixed continuous/discrete model, block diagram form.
 mixedm - Mixed continuous/discrete model, M-file form.
 limintm - Limited integrator block, M-file form.
 vlimintm - Vectorized limited integrator, M-file form.
 vdlmintm - Discrete-time vectorized limited integrator, M-file.
 sfuntmpl - M-file S-function template.
 csfunc - Continuous-time model, M-file form.
 dsfunc - Discrete-time model, M-file form.
 vsfunc - Variable sample-time model, M-file form.
 sfuncont - M-file S-function template, continuous-time model.
 sfundsc1 - M-file S-function template, discrete real-time model.
 sfundsc2 - M-file S-function template, discrete sampled model.
 timestwo - M-file S-function example.

The MATLABROOT/simulink directory contains the source code for examples of C, Fortran, and Ada implementations of the above blocks.

4. OPTIMIZATION TOOLBOX

Nonlinear minimization of functions.

fminbnd - Scalar bounded nonlinear function minimization.
 fmincon - Multidimensional constrained nonlinear minimization.
 fminsearch - Multidimensional unconstrained nonlinear minimization, by Nelder-Mead direct search method.
 fminunc - Multidimensional unconstrained nonlinear minimization.
 fseminf - Multidimensional constrained minimization, semi-infinite constraints.

Nonlinear minimization of multi-objective functions.

fgoalattain - Multidimensional goal attainment optimization
 fminimax - Multidimensional minimax optimization.

Linear least squares (of matrix problems).

lsqlin - Linear least squares with linear constraints.
 lsqnonneg - Linear least squares with nonnegativity constraints.

Nonlinear least squares (of functions).

lsqcurvefit - Nonlinear curvefitting via least squares (with bounds).
 lsqnonlin - Nonlinear least squares with upper and lower bounds.

Nonlinear zero finding (equation solving).

fzero - Scalar nonlinear zero finding.
 fsolve - Nonlinear system of equations solve (function solve).

Minimization of matrix problems.

linprog - Linear programming.
 quadprog - Quadratic programming.

Controlling defaults and options.

optimset - Create or alter optimization OPTIONS structure.
 optimget - Get optimization parameters from OPTIONS structure.

Demonstrations of large-scale methods.

circustent - Quadratic programming to find shape of a circus tent.
 molecule - Molecule conformation solution using unconstrained nonlinear minimization.
 optdeblur - Image deblurring using bounded linear least-squares.

Demonstrations of medium-scale methods.

optdemo - Demonstration menu.
 tutdemo - Tutorial walk-through.
 bandemo - Minimization of banana function.
 goaldemo - Goal attainment.
 dfildemo - Finite-precision filter design (requires Signal Processing Toolbox).
 datdemo - Fitting data to a curve.

Medium-scale examples from User's Guide

objfun - nonlinear objective
confun - nonlinear constraints
objfungrad - nonlinear objective with gradient
confungrad - nonlinear constraints with gradients
confuneq - nonlinear equality constraints
optsim.mdl - simulink model of nonlinear plant process
optsiminit - init file for optsim.mdl
tracklsq - multiobjective lsqnonlin objective
trackmmobj - multiobjective fminimax objective
trackmmcon - multiobjective fminimax constraints

Large-scale examples from User's Guide

nlsf1 - nonlinear equations objective with Jacobian
nlsfla - nonlinear equations objective
nlsdat1 - MAT-file of Jacobian sparsity pattern (see nlsfla)
brownfgh - nonlinear minimization objective with gradient and Hessian
brownfg - nonlinear minimization objective with gradient
brownhstr - MAT-file of Hessian sparsity pattern (see brownfg)
tbroyfg - nonlinear minimization objective with gradient
tbroyhstr - MAT-file of Hessian sparsity pattern (see tbroyfg)
browneg - MAT-file of Aeq and beq sparse linear equality constraints
runfleq1 - demonstrates 'HessMult' option for FMINCON with equalities
brownvv - nonlinear minimization with dense structured Hessian
hmfleq1 - Hessian matrix product for brownvv objective
fleq1 - MAT-file of V matrix for brownvv, hmfleq1 and Aeq,beq
qpbox1 - MAT-file of quadratic objective Hessian sparse matrix
runqpbox4 - demonstrates 'HessMult' option for QUADPROG with bounds
qpbox4 - MAT-file of quadratic programming problem matrices
runnls3 - demonstrates 'JacobMult' option for LSQNONLIN
nlsmm3 - Jacobian multiply function for runnls3/nlsf3a objective
nlsdat1 - MAT-file of problem matrices for runnls3/nlsf3a objective
runqpeq5 - demonstrates 'HessMult' option for QUADPROG with equalities
qpeq5 - MAT-file of quadratic programming matrices for runqpeq5
particle - MAT-file of linear least squares C and d sparse matrices
sc50b - MAT-file of linear programming example
densecolumns - MAT-file of linear programming example