Title

> **mathematical —** Important mathematical functions

Contents

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Manual entry	Function	Purpose

Basics (also see [M-4] **scalar**)

Manual entry	Function	Purpose
sum( )	rowsum()	sum of each row
	colsum()	sum of each column
	sum()	overall sum
	quadrowsum()	quad-precision sum of each row
	quadcolsum()	quad-precision sum of each column
	quadsum()	quad-precision overall sum
runningsum( )	runningsum()	running sum of vector
	quadrunningsum()	quad-precision runningsum()
minmax( )	rowmin()	minimum, by row
	colmin()	minimum, by column
	min()	minimum, overall
	rowmax()	maximum, by row
	colmax()	maximum, by column
	max()	maximum, overall
	rowminmax()	minimum and maximum, by row
	colminmax()	minimum and maximum, by column
	minmax()	minimum and maximum, overall
	rowmaxabs()	rowmax(abs())
	colmaxabs()	colmax(abs())
deriv( )	deriv()	numerical derivatives
	deriv_init()	begin derivatives
	deriv_init_*()	set details
	deriv()	compute derivatives
	deriv_result_*()	access results
	deriv_query()	report settings
optimize( )	optimize()	function maximization and minimization
	optimize_init()	begin optimization
	optimize_init_*()	set details
	optimize()	perform optimization
	optimize_result_*()	access results
	optimize_query()	report settings

Basics, *continued*

moptimize( )   moptimize()   function optimization
               moptimize_ado_cleanup() perform cleanup after ado
               moptimize_evaluate()   evaluate function at initial values
               moptimize_init()   begin setup of optimization problem
               moptimize_init_*()   set details
               moptimize_result_*()   access moptimize() results
               moptimize_query()   report settings
               moptimize_util_*()   utility functions for writing evaluators and
                                            processing results

solvenl( )   solvenl_init()   begin solver
               solvenl_init_*()   set details
               solvenl_solve()   solve equations
               solvenl_result_*()   access results
               solvenl_dump()   report detailed settings

Fourier transform

fft( )   fft()   fast Fourier transform
               invfft()   inverse fast Fourier transform
               convolve()   convolution
               deconvolve()   inverse of convolve()
               Corr()   correlation
               ftperiodogram()   power spectrum
               ftpad()   pad to power-of-2 length
               ftwrap()   convert to frequency-wraparound order
               ftunwrap()   convert from frequency-wraparound order
               ftretime()   change time scale of signal
               ftfreqs()   frequencies of transform

Cubic splines

spline3( )   spline3()   fit cubic spline
               spline3eval()   evaluate cubic spline

	Polynomials	

[polyeval( )](#)	polyeval()	evaluate polynomial
	polysolve()	solve for polynomial
	polytrim()	trim polynomial
	polyderiv()	derivative of polynomial
	polyinteg()	integral of polynomial
	polyadd()	add polynomials
	polymult()	multiply polynomials
	polydiv()	divide polynomials
	polyroots()	find roots of polynomial

	Number-theoretic point sets	

[halton( )](#)	halton()	generate a Halton or Hammersley set
	ghalton()	generate a generalized Halton sequence

	Base conversion	

[inbase( )](#)	inbase()	convert to specified base
	frombase()	convert from specified base

Description

The above functions are important mathematical functions that most people would not call either matrix functions or scalar functions, but that use matrices and scalars.

Remarks and examples

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For other mathematical functions, see

[M-4] **matrix**	Matrix mathematical functions
[M-4] **scalar**	Scalar mathematical functions
[M-4] **statistical**	Statistical functions

Also see

[M-4] **intro** — Index and guide to functions