Title

matrix — Matrix functions

Contents Description Remarks and examples Also see

Contents

[M-5] Manual entry	Function	Purpose
Characteristics		
trace()	`trace()`	trace of matrix
det()	`det()`	determinant
	`dettriangular()`	determinant of triangular matrix
norm()	`norm()`	matrix and vector norms
cond()	`cond()`	matrix condition number
rank()	`rank()`	rank of matrix
Cholesky decomposition, solvers, & inverters		
cholesky()	`cholesky()`	Cholesky square-root decomposition $A = GG'$
cholsolve()	`cholsolve()`	solve $AX = B$ for X
cholinv()	`cholinv()`	inverse of pos. def. symmetric matrix
invsym()	`invsym()`	real symmetric matrix inversion
LU decomposition, solvers, & inverters		
lud()	`lud()`	LU decomposition $A = PLU$
lusolve()	`lusolve()`	solve $AX = B$ for X
luinv()	`luinv()`	inverse of square matrix

QR decomposition, solvers, & inverters

qrd()	`qrd()`	QR decomposition $A = QR$
	`qrdp()`	QR decomposition $A = QRP'$
	`hqrd()`	QR decomposition $A = f(H)R_1$
	`hqrdp()`	QR decomposition $A = f(H, tau)R_1P'$
	`hqrdmultq()`	return QX or $Q'X$, $Q = f(H, tau)$
	`hqrdmultq1t()`	return $Q_1'X$, $Q_1 = f(H, tau)$
	`hqrdq()`	return $Q = f(H, tau)$
	`hqrdq1()`	return $Q_1 = f(H, tau)$
	`hqrdr()`	return R
	`hqrdr1()`	return R_1
qrsolve()	`qrsolve()`	solve $AX = B$ for X
qrinv()	`qrinv()`	generalized inverse of matrix

Hessenberg decomposition & generalized Hessenberg decomposition

hessenbergd()	`hessenbergd()`	Hessenberg decomposition $T = Q'XQ$
ghessenbergd()	`ghessenbergd()`	gen. Hessenberg decomp. $T = Q'XQ$

Schur decomposition & generalized Schur decomposition

schurd()	`schurd()`	Schur decomposition $T = U'AV$; $R = U'BA$
	`schurdgroupby()`	Schur decomp. with grouping of results
gschurd()	`gschurd()`	gen. Schur decomposition $T = U'AV$; $R = U'BA$
	`gschurdgroupby()`	gen. Schur decomp. with grouping of results

Singular value decomposition, solvers, & inverters

svd()	`svd()`	singular value decomposition $A = UDV'$
	`svdsv()`	singular values s
fullsvd()	`fullsvd()`	singular value decomposition $A = USV'$
	`fullsdiag()`	convert s to S
svsolve()	`svsolve()`	solve $AX = B$ for X
pinv()	`pinv()`	Moore–Penrose pseudoinverse

Triangular solvers		
solvelower( )	`solvelower()`	solve $AX = B$ for X, A lower triangular
	`solveupper()`	solve $AX = B$ for X, A upper triangular
Eigensystems, powers, & transcendental		
eigensystem( )	`eigensystem()`	eigenvectors and eigenvalues
	`eigenvalues()`	eigenvalues
	`lefteigensystem()`	left eigenvectors and eigenvalues
	`symeigensystem()`	eigenvectors/eigenvalues of symmetric matrix
	`symeigenvalues()`	eigenvalues of symmetric matrix
eigensystemselect( )	`eigensystemselect*()`	selected eigenvectors/eigenvalues
	etc.	
geigensystem( )	`geigensystem()`	generalized eigenvectors/eigenvalues
	etc.	
matpowersym( )	`matpowersym()`	powers of symmetric matrix
matexpsym( )	`matexpsym()`	exponentiation of symmetric matrix
	`matlogsym()`	logarithm of symmetric matrix
Equilibration		
_equilrc( )	`_equilrc()`	row/column equilibration
	`_equilr()`	row equilibration
	`_equilc()`	column equilibration
	`_perhapsequilrc()`	row/column equilibration if necessary
	`_perhapsequilr()`	row equilibration if necessary
	`_perhapsequilc()`	column equilibration if necessary
	`rowscalefactors()`	row-scaling factors for equilibration
	`colscalefactors()`	column-scaling factors for equilibration
LAPACK		
lapack( )	`LA_*()`	LAPACK linear-algebra functions
	`_flopin()`	convert matrix order from row major to column major
	`_flopout()`	convert matrix order from column major to row major

Description

The above functions are what most people would call mathematical matrix functions.

Remarks and examples

stata.com

For other mathematical functions, see

[M-4] **scalar**	Scalar mathematical functions
[M-4] **mathematical**	Important mathematical functions

Also see

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