cond( ) — Condition number

Description Syntax Remarks and examples Conformability Diagnostics Also see

Description

`cond(`*A*`)` returns `cond(`*A*`, 2)`.

`cond(`*A*`, `*p*`)` returns the value of the condition number of *A* for the specified norm *p*, where *p* may be 0, 1, 2, or `.` (missing).

Syntax

real scalar `cond(`*numeric matrix A*`)`

real scalar `cond(`*numeric matrix A*`, `*real scalar p*`)`

Remarks and examples

The condition number of a matrix *A* is

$$cond = \texttt{norm}(A, p) \times \texttt{norm}(A^{-1}, p)$$

These functions return missing when *A* is singular.

Values near 1 indicate that the matrix is well conditioned, and large values indicate ill conditioning.

Conformability

`cond(`*A*`)`:

A:	$r \times c$
result:	1×1

`cond(`*A*`, `*p*`)`:

A:	$r \times c$
p:	1×1
result:	1×1

Diagnostics

`cond(`*A*`, `*p*`)` aborts with error if *p* is not 0, 1, 2, or `.` (missing).

`cond(`*A*`)` and `cond(`*A*`, `*p*`)` return missing when *A* is singular or if *A* contains missing values.

`cond(`*A*`)` and `cond(`*A*`, `*p*`)` return 1 when *A* is void.

`cond(`*A*`)` and `cond(`*A*`, 2)` return missing if the SVD algorithm fails to converge, which is highly unlikely; see [M-5] **svd( )**.

Also see

[M-5] **norm( )** — Matrix and vector norms

[M-4] **Matrix** — Matrix functions