Syntax

\textit{real scalar} \hspace{0.5cm} \texttt{cond(numeric matrix \(A\))}

\textit{real scalar} \hspace{0.5cm} \texttt{cond(numeric matrix \(A\), real scalar \(p\))}

Description

\(\text{cond}(A)\) returns \(\text{cond}(A, 2)\).

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

Remarks and examples

The condition number of a matrix \(A\) is

\[ \text{cond} = \text{norm}(A, p) \times \text{norm}(A^{-1}, p) \]

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

\(\text{cond}(A)\):

\(A:\) \hspace{0.5cm} \(r \times c\)

\textit{result:} \hspace{0.5cm} \(1 \times 1\)

\(\text{cond}(A, p)\):

\(A:\) \hspace{0.5cm} \(r \times c\)

\(p:\) \hspace{0.5cm} \(1 \times 1\)

\textit{result:} \hspace{0.5cm} \(1 \times 1\)

Diagnostics

\(\text{cond}(A, p)\) aborts with error if \(p\) is not 0, 1, 2, or . (missing).

\(\text{cond}(A)\) and \(\text{cond}(A, p)\) return missing when \(A\) is singular or if \(A\) contains missing values.

\(\text{cond}(A)\) and \(\text{cond}(A, p)\) 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