

det() — Determinant of matrix

Description
Diagnostics

Syntax
Also see

Remarks and examples

Conformability

Description

`det(A)` returns the determinant of A .

`dettriangular(A)` returns the determinant of A , treating A as if it were triangular (even if it is not).

Syntax

numeric scalar `det(numeric matrix A)`

numeric scalar `dettriangular(numeric matrix A)`

Remarks and examples

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Calculation of the determinant is made by obtaining the LU decomposition of A and then calculating the determinant of U :

$$\begin{aligned}\det(A) &= \det(PLU) \\ &= \det(P) \times \det(L) \times \det(U) \\ &= \pm 1 \times 1 \times \det(U) \\ &= \pm \det(U)\end{aligned}$$

Since U is (upper) triangular, $\det(U)$ is simply the product of its diagonal elements. See [M-5] `lud()`.

Conformability

`det(A)`, `dettriangular(A)`:
A: $n \times n$
result: 1×1

Diagnostics

`det(A)` and `dettriangular(A)` return 1 if A is 0×0 .

`det(A)` aborts with error if A is not square and returns missing if A contains missing values.

`dettriangular(A)` aborts with error if A is not square and returns missing if any element on the diagonal of A is missing.

Both `det(A)` and `dettriangular(A)` will return missing value if the determinant exceeds $8.99e+307$.

Also see

[M-5] `lud()` — LU decomposition

[M-4] `matrix` — Matrix functions