

conj() — Complex conjugate

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Description

`conj(Z)` returns the elementwise complex conjugate of Z , that is, $\text{conj}(a+bi) = a - bi$. `conj()` may be used with real or complex matrices. If Z is real, Z is returned unmodified.

`_conj(A)` replaces A with $\text{conj}(A)$. Coding `_conj(A)` is equivalent to coding $A = \text{conj}(A)$, except that less memory is used.

Syntax

numeric matrix `conj(numeric matrix Z)`

void `_conj(numeric matrix A)`

Remarks and examples

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Given $m \times n$ matrix Z , `conj(Z)` returns an $m \times n$ matrix; it does not return the transpose. To obtain the conjugate transpose matrix, also known as the adjoint matrix, adjugate matrix, Hermitian adjoint, or Hermitian transpose, code

$$Z'$$

See [\[M-2\] op_transpose](#).

A matrix equal to its conjugate transpose is called Hermitian or self-adjoint, although in this manual, we often use the term symmetric.

Conformability

`conj(Z)`:

Z: $r \times c$
result: $r \times c$

`_conj(A)`:

input:
A: $r \times c$
output:
A: $r \times c$

Diagnostics

`conj(Z)` returns a real matrix if Z is real and a complex matrix if Z is complex.

`conj(Z)`, if Z is real, returns Z itself and not a copy. This makes `conj()` execute instantly when applied to real matrices.

`_conj(A)` does nothing if A is real (and hence, does not abort if A is a view).

Also see

[M-5] `_transpose()` — Transposition in place

[M-4] `Scalar` — Scalar mathematical functions