Title

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Kmatrix( ) — Commutation matrix

Description

`Kmatrix(`*m*`,` *n*`)` returns the $mn \times mn$ commutation matrix `K` for which `K*vec(`*X*`) = vec(`*X*`')`, where *X* is an $m \times n$ matrix.

Syntax

real matrix `Kmatrix(`*real scalar m*`,` *real scalar n*`)`

Remarks and examples

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Commutation matrices are frequently used in computing derivatives of functions of matrices. Section 9.2 of Lütkepohl (1996) lists many useful properties of commutation matrices.

Conformability

`Kmatrix(`*m*`,` *n*`)`:

m:	1×1
n:	1×1
result:	$mn \times mn$

Diagnostics

`Kmatrix(`*m*`,` *n*`)` aborts with error if either *m* or *n* is less than 0 or is missing. *m* and *n* are interpreted as `trunc(`*m*`)` and `trunc(`*n*`)`.

Reference

Lütkepohl, H. 1996. *Handbook of Matrices*. New York: Wiley.

Also see

[M-5] **Dmatrix( )** — Duplication matrix

[M-5] **Lmatrix( )** — Elimination matrix

[M-5] **vec( )** — Stack matrix columns

[M-4] **Standard** — Functions to create standard matrices