Kmatrix() — Commutation matrix

Description
Kmatrix(\(m, n\)) returns the \(mn \times mn\) commutation matrix \(K\) for which \(K\cdot \text{vec}(X) = \text{vec}(X')\), where \(X\) is an \(m \times n\) matrix.

Syntax

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

Remarks and examples
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(\(m, n\)):
\[
m: \quad 1 \times 1 \\
n: \quad 1 \times 1 \\
result: \quad mn \times mn
\]

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 \(\text{trunc}(m)\) and \(\text{trunc}(n)\).

Reference

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