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):

- $m$: $1 \times 1$
- $n$: $1 \times 1$
- 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 $\text{trunc}(m)$ 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