

**Kmatrix()** — Commutation matrix

<a href="#">Description</a>	<a href="#">Syntax</a>	<a href="#">Remarks and examples</a>	<a href="#">Conformability</a>
<a href="#">Diagnostics</a>	<a href="#">Reference</a>	<a href="#">Also see</a>	

## 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

[stata.com](#)

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)`:

<i>m</i> :	$1 \times 1$
<i>n</i> :	$1 \times 1$
<i>result</i> :	$mn \times mn$

## 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