

Dmatrix() — Duplication matrix

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Description

`Dmatrix(n)` returns the $n^2 \times n(n+1)/2$ duplication matrix D for which $D \cdot \text{vech}(X) = \text{vec}(X)$, where X is an arbitrary $n \times n$ symmetric matrix.

Syntax

real matrix `Dmatrix(real scalar n)`

Remarks and examples

[stata.com](#)

Duplication matrices are frequently used in computing derivatives of functions of symmetric matrices. Section 9.5 of [Lütkepohl \(1996\)](#) lists many useful properties of duplication matrices.

Conformability

`Dmatrix(n)`:
n: 1×1
result: $n^2 \times n(n+1)/2$

Diagnostics

`Dmatrix(n)` aborts with error if n is less than 0 or is missing. n is interpreted as `trunc(n)`.

Reference

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

Also see

[M-5] [Kmatrix\(\)](#) — Commutation matrix

[M-5] [Lmatrix\(\)](#) — Elimination matrix

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[M-4] [standard](#) — Functions to create standard matrices