Dmatrix() — Duplication matrix

Description

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

Syntax

```
real matrix Dmatrix(real scalar n)
```

Remarks and examples

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   \times   1
  result:   n^2 \times \frac{n(n+1)}{2}
```

Diagnostics

Dmatrix(n) aborts with error if $n$ is less than 0 or is missing. $n$ is interpreted as $\text{trunc}(n)$.

Reference


Also see

[M-5] Kmatrix() — Commutation matrix
[M-5] Lmatrix() — Elimination matrix
[M-5] vec() — Stack matrix columns
[M-4] Standard — Functions to create standard matrices