invorder() — Permutation vector manipulation

Description

`invorder(`*p*`)` returns the permutation vector that undoes the permutation performed by *p*.

`revorder(`*p*`)` returns the permutation vector that is the reverse of the permutation performed by *p*.

Syntax

real vector `invorder(`*real vector p*`)`

real vector `revorder(`*real vector p*`)`

where *p* is assumed to be a permutation vector.

Remarks and examples stata.com

See [M-1] **Permutation** for a description of permutation vectors. To summarize,

1. Permutation vectors *p* are used to permute the rows or columns of a matrix X: $r \times c$.

   If *p* is intended to permute the rows of X, the permuted X is obtained via Y = X`[`*p*`, .]`.

   If *p* is intended to permute the columns of X, the permuted X is obtained via Y = X`[., `*p*`]`.

2. If *p* is intended to permute the rows of X, it is called a row-permutation vector. Row-permutation vectors are $r \times 1$ column vectors.

3. If *p* is intended to permute the columns of X, it is called a column-permutation vector. Column-permutation vectors are $1 \times c$ row vectors.

4. Row-permutation vectors contain a permutation of the integers 1 to r.

5. Column-permutation vectors contain a permutation of the integers 1 to c.

Let us assume that *p* is a row-permutation vector, so that

    Y = X[p, .]

`invorder(`*p*`)` returns the row-permutation vector that undoes *p*:

    X = Y[invorder(p), .]

That is, using the matrix notation of [M-1] **Permutation**,

$$Y = PX \qquad \text{implies} \qquad X = P^{-1}Y$$

If p is the permutation vector corresponding to permutation matrix P, `invorder(`p`)` is the permutation vector corresponding to permutation matrix P^{-1}.

`revorder(`p`)` returns the permutation vector that reverses the order of p. For instance, say that row-permutation vector p permutes the rows of X so that the diagonal elements are in ascending order. Then `revorder(`p`)` would permute the rows of X so that the diagonal elements would be in descending order.

Conformability

`invorder(`p`)`, `revorder(`p`)`:

p:	$r \times 1$	or	$1 \times c$
result:	$r \times 1$	or	$1 \times c$

Diagnostics

`invorder(`p`)` and `revorder(`p`)` can abort with error or can produce meaningless results when p is not a permutation vector.

Also see

[M-1] **Permutation** — An aside on permutation matrices and vectors

[M-4] **Manipulation** — Matrix manipulation

For suggested citations, see the FAQ on citing Stata documentation.