

sort() — Reorder rows of matrix

Description Diagnostics	Syntax Also see	Remarks and examples	Conformability
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Description

`sort(X, idx)` returns *X* with rows in ascending or descending order of the columns specified by *idx*. For instance, `sort(X, 1)` sorts *X* on its first column; `sort(X, (1,2))` sorts *X* on its first and second columns (meaning rows with equal values in their first column are ordered on their second column). In general, the *i*th sort key is column `abs(idx[i])`. Order is ascending if `idx[i] > 0` and descending otherwise. Ascending and descending are defined in terms of [\[M-5\] abs\(\)](#) (length of elements) for complex.

`_sort(X, idx)` does the same as `sort(X, idx)`, except that *X* is sorted in place.

`jumble(X)` returns *X* with rows in random order. For instance, to shuffle a deck of cards numbered 1 to 52, one could code `jumble(1::52)`. See `rseed()` in [\[M-5\] runiform\(\)](#) for information on setting the random-number seed.

`_jumble(X)` does the same as `jumble(X)`, except that *X* is jumbled in place.

`order(X, idx)` returns the permutation vector—see [\[M-1\] permutation](#)—that would put *X* in ascending (descending) order of the columns specified by *idx*. A row-permutation vector is a $1 \times c$ column vector containing the integers 1, 2, ..., *c* in some order. Vectors (1\2\3), (1\3\2), (2\1\3), (2\3\1), (3\1\2), and (3\2\1) are examples. Row-permutation vectors are used to specify the order in which the rows of a matrix *X* are to appear. If *p* is a row-permutation vector, `X[p, .]` returns *X* with its rows in the order of *p*; *p* = (3\2\1) would reverse the rows of *X*. `order(X, idx)` returns the row-permutation vector that would sort *X* and, as a matter of fact, `sort(X, idx)` is implemented as `X[order(X, idx), .]`.

`unorder(n)` returns a $1 \times n$ permutation vector for placing the rows in random order. Random numbers are calculated by `runiform()`; see `rseed()` in [\[M-5\] runiform\(\)](#) for information on setting the random-number seed. `jumble()` is implemented in terms of `unorder()`: `jumble(X)` is equivalent to `X[unorder(rows(X)), .]`.

`_collate(X, p)` is equivalent to `X = X[p, .]`; it changes the order of the rows of *X*. `_collate()` is used by `_sort()` and `_jumble()` and has the advantage over subscripting in that no extra memory is required when the result is to be assigned back to itself. Consider

$$X = X[p, .]$$

There will be an instant after `X[p, .]` has been calculated but before the result has been assigned back to *X* when two copies of *X* exist. `_collate(X, p)` avoids that. `_collate()` is not a substitute for subscripting in all cases; `_collate()` requires *p* be a permutation vector.

Syntax

<i>transmorphic matrix</i>	<code>sort(transmorphic matrix X, real rowvector idx)</code>
<i>void</i>	<code>_sort(transmorphic matrix X, real rowvector idx)</code>
<i>transmorphic matrix</i>	<code>jumble(transmorphic matrix X)</code>
<i>void</i>	<code>_jumble(transmorphic matrix X)</code>
<i>real colvector</i>	<code>order(transmorphic matrix X, real rowvector idx)</code>
<i>real colvector</i>	<code>unorder(real scalar n)</code>
<i>void</i>	<code>_collate(transmorphic matrix X, real colvector p)</code>

where

1. X may not be a pointer matrix.
2. p must be a permutation column vector, a $1 \times c$ vector containing the integers 1, 2, ..., c in some order.

Remarks and examples

[stata.com](http://www.stata.com)

If X is complex, the ordering is defined in terms of [M-5] `abs()` of its elements.

Also see `invorder()` and `revorder()` in [M-5] `invorder()`. Let p be the permutation vector returned by `order()`:

$$p = \text{order}(X, \dots)$$

Then $X[p, .]$ are the sorted rows of X . `revorder()` can be used to reverse sort order: $X[\text{revorder}(p), .]$ are the rows of X in the reverse of the order of $X[p, .]$. `invorder()` provides the inverse transform: If $Y = X[p, .]$, then $X = Y[\text{invorder}(p), .]$.

Conformability

`sort(X, idx), jumble(X):`

<i>X:</i>	$r_1 \times c_1$
<i>idx:</i>	$1 \times c_2, c_2 \leq c_1$
<i>result:</i>	$r_1 \times c_1$

`_sort(X, idx), _jumble(X):`

<i>X:</i>	$r_1 \times c_1$
<i>idx:</i>	$1 \times c_2, c_2 \leq c_1$
<i>result:</i>	<i>void</i> ; X row order modified

`order(X, idx):`

<i>X:</i>	$r_1 \times c_1$
<i>idx:</i>	$1 \times c_2, c_2 \leq c_1$
<i>result:</i>	$r_1 \times 1$

`unorder(n):`

n: 1×1
result: $n \times 1$

`_collate(X, p)`:

X: $r \times c$
p: $r \times 1$
result: *void*; *X* row order modified

Diagnostics

`sort(X, idx)` aborts with error if any element of `abs(idx)` is less than 1 or greater than `rows(X)`.

`_sort(X, idx)` aborts with error if any element of `abs(idx)` is less than 1 or greater than `rows(X)`, or if *X* is a view.

`_jumble(X)` aborts with error if *X* is a view.

`order(X, idx)` aborts with error if any element of `abs(idx)` is less than 1 or greater than `rows(X)`.

`unorder(n)` aborts with error if $n < 1$.

`_collate(X, p)` aborts with error if *p* is not a permutation vector or if *X* is a view.

Also see

[M-5] [invorder\(\)](#) — Permutation vector manipulation

[M-5] [uniqrows\(\)](#) — Obtain sorted, unique values

[M-5] [ustrcompare\(\)](#) — Compare or sort Unicode strings

[M-4] [manipulation](#) — Matrix manipulation