

Description

These functions return the indicated minimums and maximums of X .

`rowmin(X)` returns the minimum of each row of X , `colmin(X)` returns the minimum of each column, and `min(X)` returns the overall minimum. Elements of X that contain missing values are ignored.

`rowmax(X)` returns the maximum of each row of X , `colmax(X)` returns the maximum of each column, and `max(X)` returns the overall maximum. Elements of X that contain missing values are ignored.

`rowminmax(X)` returns the minimum and maximum of each row of X in a $r \times 2$ matrix; `colminmax(X)` returns the minimum and maximum of each column in a $2 \times c$ matrix; and `minmax(X)` returns the overall minimum and maximum. Elements of X that contain missing values are ignored.

The two-argument versions of `rowminmax()`, `colminmax()`, and `minmax()` allow you to specify how missing values are to be treated. Specifying a second argument with value 0 is the same as using the single-argument versions of the functions. In the two-argument versions, if the second argument is not zero, missing values are treated like all other values in determining the minimums and maximums: *non-missing* $< . < .a < .b < \dots < .z$.

`rowmaxabs(A)` and `colmaxabs(A)` return the same result as `rowmax(abs(A))` and `colmax(abs(A))`. The advantage is that matrix `abs(A)` is never formed or stored, and so these functions use less memory.

Syntax

real colvector `rowmin(real matrix X)`

real rowvector `colmin(real matrix X)`

real scalar `min(real matrix X)`

real colvector `rowmax(real matrix X)`

real rowvector `colmax(real matrix X)`

real scalar `max(real matrix X)`

real matrix `rowminmax(real matrix X)`

real matrix `colminmax(real matrix X)`

real rowvector `minmax(real matrix X)`

real matrix `rowminmax(real matrix X , real scalar usemiss)`

real matrix `colminmax(real matrix X , real scalar usemiss)`

real rowvector `minmax(real matrix X , real scalar usemiss)`

real colvector `rowmaxabs(numeric matrix A)`

real rowvector `colmaxabs(numeric matrix A)`

Conformability

```
rowmin(X), rowmax(X):
    X:       $r \times c$ 
    result:   $r \times 1$ 
```

```
colmin(X), colmax(X):
    X:       $r \times c$ 
    result:   $1 \times c$ 
```

```
min(X), max(X):
    X:       $r \times c$ 
    result:   $1 \times 1$ 
```

```
rowminmax(X, usemiss):
    X:       $r \times c$ 
    usemiss:  $1 \times 1$ 
    result:   $r \times 2$ 
```

```
colminmax(X, usemiss)
    X:       $r \times c$ 
    usemiss:  $1 \times 1$ 
    result:   $2 \times c$ 
```

```
minmax(X, usemiss)
    X:       $r \times c$ 
    usemiss:  $1 \times 1$ 
    result:   $1 \times 2$ 
```

```
rowmaxabs(A):
    A:       $r \times c$ 
    result:   $r \times 1$ 
```

```
colmaxabs(A):
    A:       $r \times c$ 
    result:   $1 \times c$ 
```

Diagnostics

`row*()` functions return missing values for the corresponding minimum or maximum when the entire row contains missing.

`col*()` functions return missing values for the corresponding minimum or maximum when the entire column contains missing.

`min()` and `max()` return missing values when the entire matrix contains missing values.

Also see

[M-5] [minindex\(\)](#) — Indices of minimums and maximums

[M-4] [Mathematical](#) — Important mathematical functions

[M-4] **Utility** — Matrix utility functions

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