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# Description

rowsum(Z) and rowsum(Z, missing) return a column vector containing the sum over the rows of Z.

colsum(Z) and colsum(Z, missing) return a row vector containing the sum over the columns of Z.

sum(Z) and sum(Z, missing) return a scalar containing the sum over the rows and columns of Z.

quadrowsum(), quadcolsum(), and quadsum() are quad-precision variants of the above functions. The sum is accumulated in quad precision and then rounded to double precision and returned.

Argument missing determines how missing values are treated. If missing is not specified, results are the same as if missing = 0 were specified: missing values are treated as zero. If missing = 1 is specified, missing values are treated as missing values.

These functions may be used with real or complex matrix Z.

#### Syntax

numeric colvector	rowsum(numeric matrix Z [, missing])
numeric rowvector	colsum(numeric matrix Z [, missing])
numeric scalar	sum(numeric matrix Z [, missing])
numeric colvector	quadrowsum(numeric matrix Z [, missing])
numeric rowvector	quadcolsum(numeric matrix Z [, missing])
numeric scalar	quadsum(numeric matrix Z [, missing])

where optional argument *missing* is a real scalar that determines how missing values in Z are treated:

- 1. Specifying *missing* as 0 is equivalent to not specifying the argument; missing values in Z are treated as contributing 0 to the sum.
- 2. Specifying *missing* as 1 (or nonzero) specifies that missing values in Z are to be treated as missing values and to turn the sum to missing.

#### **Remarks and examples**

All functions return the same type as the argument, real if argument is real, complex if complex.

## Conformability

rowsum(Z, missing), quadrowsum(Z, missing): Z:  $r \times c$ missing:  $1 \times 1$ (optional) result:  $r \times 1$ colsum(Z, missing), quadcolsum(Z, missing): Z:  $r \times c$  $1 \times 1$ (optional) missing: result:  $1 \times c$ sum(Z, missing), quadsum(Z, missing): Z:  $r \times c$ missing:  $1 \times 1$ (optional) result:  $1 \times 1$ 

### Diagnostics

If missing = 0, missing values are treated as contributing zero to the sum; they do not turn the sum to missing. Otherwise, missing values turn the sum to missing.

### Also see

[M-5] cross() — Cross products

[M-5] mean() — Means, variances, and correlations

[M-5] runningsum() — Running sum of vector

[M-4] Mathematical — Important mathematical functions

[M-4] Utility — Matrix utility functions

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