Syntax

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

where optional argument \texttt{missing} is a real scalar that determines how missing values in \( Z \) are treated:

1. Specifying \texttt{missing} as 0 is equivalent to not specifying the argument; missing values in \( Z \) are treated as contributing 0 to the sum.
2. Specifying \texttt{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.

Description

\texttt{rowsum(}Z\texttt{)} and \texttt{rowsum(}Z, missing\texttt{)} return a column vector containing the sum over the rows of \( Z \).
\texttt{colsum(}Z\texttt{)} and \texttt{colsum(}Z, missing\texttt{)} return a row vector containing the sum over the columns of \( Z \).
\texttt{sum(}Z\texttt{)} and \texttt{sum(}Z, missing\texttt{)} return a scalar containing the sum over the rows and columns of \( Z \).
\texttt{quadrowsum()}, \texttt{quadcolsum()}, and \texttt{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 \texttt{missing} determines how missing values are treated. If \texttt{missing} is not specified, results are the same as if \texttt{missing = 0} were specified: missing values are treated as zero. If \texttt{missing = 1} is specified, missing values are treated as missing values.

These functions may be used with real or complex matrix \( Z \).
Remarks and examples

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

Conformability

\[ \text{rowsum}(Z, \text{missing}), \text{quadrowsum}(Z, \text{missing}) : \]
\[
\text{Z: } r \times c \\
\text{missing: } 1 \times 1 \quad \text{(optional)} \\
\text{result: } r \times 1
\]

\[ \text{colsum}(Z, \text{missing}), \text{quadcolsum}(Z, \text{missing}) : \]
\[
\text{Z: } r \times c \\
\text{missing: } 1 \times 1 \quad \text{(optional)} \\
\text{result: } 1 \times c
\]

\[ \text{sum}(Z, \text{missing}), \text{quadsum}(Z, \text{missing}) : \]
\[
\text{Z: } r \times c \\
\text{missing: } 1 \times 1 \quad \text{(optional)} \\
\text{result: } 1 \times 1
\]

Diagnostics

If \textit{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] \textit{mean()} — Means, variances, and correlations
[M-5] \textit{runningsum()} — Running sum of vector
[M-5] \textit{cross()} — Cross products
[M-4] \textit{mathematical} — Important mathematical functions
[M-4] \textit{utility} — Matrix utility functions