Title

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quadcross( ) — Quad-precision cross products

Description

`quadcross()` makes calculations of the form

$X'X$

$X'Z$

X'`diag(`w`)`X

X'`diag(`w`)`Z

This function mirrors `cross()` (see [M-5] **cross( )**), the difference being that sums are formed in quad precision rather than in double precision, so `quadcross()` is more accurate.

`quadcrossdev()` makes calculations of the form

$(X\colon -x)'(X\colon -x)$

$(X\colon -x)'(Z\colon -z)$

$(X\colon -x)'$`diag(`w`)`$(X\colon -x)$

$(X\colon -x)'$`diag(`w`)`$(Z\colon -z)$

This function mirrors `crossdev()` (see [M-5] **crossdev( )**), the difference being that sums are formed in quad precision rather than in double precision, so `quadcrossdev()` is more accurate.

Syntax

real matrix `quadcross(`X`, `Z`)`

real matrix `quadcross(`X`, `w`, `Z`)`

real matrix `quadcross(`X`, `xc`, `Z`, `zc`)`

real matrix `quadcross(`X`, `xc`, `w`, `Z`, `zc`)`

real matrix `quadcrossdev(`X`, `x`, `Z`, `z`)`

real matrix `quadcrossdev(`X`, `x`, `w`, `Z`, `z`)`

real matrix `quadcrossdev(`X`, `xc`, `x`, `Z`, `zc`, `z`)`

real matrix `quadcrossdev(`X`, `xc`, `x`, `w`, `Z`, `zc`, `z`)`

where

X:	*real matrix X*
xc:	*real scalar xc*
x:	*real rowvector x*
w:	*real vector w*
Z:	*real matrix Z*
zc:	*real scalar zc*
z:	*real rowvector z*

Remarks and examples

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The returned result is double precision, but the sum calculations made in creating that double-precision result were made in quad precision.

Conformability

`quadcross()` has the same conformability requirements as `cross()`; see [M-5] **cross( )**.

`quadcrossdev()` has the same conformability requirements as `crossdev()`; see [M-5] **crossdev( )**.

Diagnostics

See *Diagnostics* in [M-5] **cross( )** and *Diagnostics* in [M-5] **crossdev( )**.

Also see

[M-5] **cross( )** — Cross products

[M-5] **crossdev( )** — Deviation cross products

[M-4] **Statistical** — Statistical functions

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