NAME

CUTEST_ubandh_threaded − CUTEst tool to extract a banded matrix from the Hessian matrix.

SYNOPSIS

CALL CUTEST_ubandh_threaded(status, n, goth, X, nsemib, BANDH, lbandh, thread)

DESCRIPTION

The CUTEST_ubandh_threaded subroutine extracts the elements which lie within a band of given semi-bandwidth out of the Hessian matrix of the objective function of the problem decoded from a SIF file by the script *sifdecode* at the point X.

The problem under consideration is to minimize or maximize an objective function $f(x)$ over all $x \in R^n$ subject to the simple bounds $x^l \leq x \leq x^u$. The objective function is group-partially separable.

ARGUMENTS

The arguments of CUTEST_ubandh_threaded are as follows

status [out] - integer
the outputr status: 0 for a succesful call, 1 for an array allocation/deallocation error, 2 for an array bound error, 3 for an evaluation error, 4 for an out-of-range thread,

n [in] - integer
the number of variables for the problem,

goth [in] - integer
a logical variable which specifies whether the second derivatives of the groups and elements have already been set (goth = .TRUE.) or if they should be computed (goth = .FALSE.),

X [in] - real/double precision
when GOTH = .FALSE., the derivatives will be evaluated at X. Otherwise X is not used.

nsemib [in] - integer
the required semi-bandwidth, i.e., the number of bands directly below the diagonal of the Hessian.

BANDH [out] - real/double precision
a two-dimensional array of dimension (0:lbandh,n) which gives the lower triangular part of the band segment of the Hessian. The diagonal entry in column i is returned in location BANDH(0,i), while the entry j places below the diagonal in column i may be found in location BANDH(j,i),

lbandh [in] - integer
the actual declared size of the leading dimension of BANDH (with lbandh no smaller than nsemib). N.B. the leading component of BANDH includes the index 0 so strictly, the size of the leading dimension is lbandh + 1.

NOTE

goth should be set to .TRUE. whenever

(1) a call has been made to CUTEST_udh_threaded, CUTEST_ush_threaded, CUTEST_ugrdh_threaded or CUTEST_ugrsh_threaded at the current point, or

(2) a previous call to CUTEST_ubandh_threaded, with goth = .FALSE.,
at the current point has been made.

Otherwise, it should be set .FALSE.,

thread [in] - integer
thread chosen for the evaluation; threads are numbered from 1 to the value threads set when calling CUTEST_usetup_threaded.

AUTHORS

I. Bongartz, A.R. Conn, N.I.M. Gould, D. Orban and Ph.L. Toint

SEE ALSO

CUTEr (and SifDec): A Constrained and Unconstrained Testing Environment, revisited,
N.I.M. Gould, D. Orban and Ph.L. Toint,
ACM TOMS, **29**:4, pp.373-394, 2003.

CUTE: Constrained and Unconstrained Testing Environment, I. Bongartz, A.R. Conn, N.I.M. Gould and Ph.L. Toint, TOMS, **21**:1, pp.123-160, 1995.

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