NAME

CUTEST_uhprod_threaded − CUTEst tool to form the matrix-vector product of a vector with the Hessian matrix.

SYNOPSIS

CALL CUTEST_uhprod_threaded(status, n, goth, X, VECTOR, RESULT, thread)

DESCRIPTION

The CUTEST_uhprod_threaded subroutine forms the product of a vector with the Hessian matrix of the objective function of the problem decoded from a SIF file by the script *sifdecoder* 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_uhprod_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] - logical
a logical variable which specifies whether the first and 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.

VECTOR [in] - real/double precision
an array which gives the vector whose product with the Hessian is required,

RESULT [out] - real/double precision
an array which gives the result of multiplying the Hessian by VECTOR.

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_uhprod_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

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SEE ALSO

CUTEst: a Constrained and Unconstrained Testing Environment with safe threads,
N.I.M. Gould, D. Orban and Ph.L. Toint,
Computational Optimization and Applications **60**:3, pp.545-557, 2014.

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,
ACM TOMS, **21**:1, pp.123-160, 1995.

cutest_chprod_threaded(3M), sifdecoder(1).