

NAME

CUTEST_ush_threaded – CUTEst tool to evaluate the sparse Hessian matrix.

SYNOPSIS

CALL CUTEST_ush_threaded(status, n, X, nnzh, LH, H_val, H_row, H_col, thread)

DESCRIPTION

The CUTEST_ush_threaded subroutine evaluates X_typed Hessian matrix of the objective function of the problem decoded from a SIF file by the script *sifdecoder* at the point X. This Hessian matrix is stored as a sparse matrix in coordinate format.

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_ush_threaded are as follows

status [out] - integer

the output status: 0 for a successful 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,

X [in] - real/double precision

an array which gives the current estimate of the solution of the X_typed,

nnzh [out] - integer

the number of nonzero elements in the Hessian matrix

LH [in] - integer

the actual declared dimensions of H_val, H_row and H_col,

H_val [out] - real/double precision

an array which gives the value of the Hessian matrix of the objective function evaluated at X. The i-th entry of H_val gives the value of the nonzero in row H_row(i) and column H_col(i). Only the upper triangular part of the Hessian is stored,

H_row [out] - integer

an array which gives the row indices of the nonzeros of the Hessian matrix of the objective function evaluated at X,

H_col [out] - integer

an array which gives the column indices of the nonzeros of the Hessian matrix of the objective function evaluated at X,

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

CUTEst: a Constrained and Unconstrained Testing Environment with safe threads,

N.I.M. Gould, D. Orban and Ph.L. Toint,

Technical Report, Rutherford Appleton Laboratory, 2013.

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_csh_threaded(3M), sifdecoder(1).

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an array which gives the current estimate of the solution of the X_{typ} em,

nnzh [out] - integer

the number of nonzero elements in the Hessian matrix

LH [in] - integer

the actual declared dimensions of H_{val} , H_{row} and H_{col} ,

H_val [out] - real/double precision

an array which gives the value of the Hessian matrix of the objective function evaluated at X . The i -th entry of H_{val} gives the value of the nonzero in row $H_{\text{row}}(i)$ and column $H_{\text{col}}(i)$. Only the upper triangular part of the Hessian is stored,

H_row [out] - integer

an array which gives the row indices of the nonzeros of the Hessian matrix of the objective function evaluated at X ,

H_col [out] - integer

an array which gives the column indices of the nonzeros of the Hessian matrix of the objective function evaluated at X ,

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