

NAME

CUTEST_ugrsh_threaded – CUTEst tool to evaluate the gradient and sparse Hessian matrix in coordinate format.

SYNOPSIS

CALL CUTEST_ugrsh_threaded(status, n, X, G, nnzh, lh, H_val, H_row, H_col)

DESCRIPTION

The CUTEST_ugrsh_threaded subroutine evaluates the gradient and 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_ugrsh_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 problem,

G [out] - real/double precision

an array which gives the value of the gradient of the objective function evaluated at X,

nnzh [out] - integer

the number of nonzeros in H_val,

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.

NOTE

Calling this routine is more efficient than separate calls to CUTEST_ugr and CUTEST_ush_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,

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_csgrsh_threaded(3M), sifdecoder(1).