NAME

CUTEST_cshj_threaded − CUTEst tool to evaluate the Hessian of the John function, in sparse format.

SYNOPSIS

CALL CUTEST_cshj_threaded(status, n, m, X, y0, Y, nnzh, lh, H_val, H_row, H_col, thread)

For real rather than double precision arguments, instead

CALL CUTEST_cshj_threaded_s(...)

and for quadruple precision arguments, when available,

CALL CUTEST_cshj_threaded_q(...)

DESCRIPTION

The CUTEST_cshj_threaded subroutine evaluates the Hessian of the John function $j(x, y0, y) = y0\, f(x) + y^T c(x)$ for the problem decoded from a SIF file by the script *sifdecoder* at the point $(x, y0, y)$ = (X,y0,Y). The matrix is stored in sparse format.

The problem under consideration is to minimize or maximize an objective function $f(x)$ over all $x \in R^n$ subject to general equations $c_i(x) = 0$, $(i \in 1, \ldots, m_E)$, general inequalities $c_i^l \leq c_i(x) \leq c_i^{u,}$ $(i \in m_E + 1, \ldots, m)$, and simple bounds $x^l \leq x \leq x^{u.}$ The objective function is group-partially separable and all constraint functions are partially separable.

ARGUMENTS

The arguments of CUTEST_cshj_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,

m [in] - integer
the total number of general constraints,

X [in] - real/double precision
an array which gives the current estimate of the solution of the problem,

y0 [in] - real/double precision
the John scalar associated with the objective,

Y [in] - real/double precision
an array which gives the John multipliers,

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 values of the Hessian matrix of the John function evaluated at X, y0 and Y. 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 John function evaluated at X, y0 and Y,

H_col [out] - integer
an array which gives the column indices of the nonzeros of the Hessian matrix of the John function evaluated at X, y0 and Y,

thread [in] - integer
thread chosen for the evaluation; threads are numbered from 1 to the value threads set when calling CUTEST_csetup_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_ush_threaded(3M), sifdecoder(1).