

NAME

CUTEst_cdhj – CUTEst tool to evaluate the Hessian of the John function.

SYNOPSIS

CALL CUTEst_cdhj(status, n, m, X, y0, Y, lh1, H_val)

For real rather than double precision arguments, instead

CALL CUTEst_cdhj_s(...)

DESCRIPTION

The CUTEst_cdhj subroutine evaluates the Hessian matrix of the John function $j(x, y_0, y) = y_0 f(x) + y^T c(x)$ for the problem decoded from a SIF file by the script *sifdecoder* at the point $(x, y_0, y) = (X, y_0, Y)$. The matrix is stored as a dense matrix.

The problem under consideration is to minimize or maximize an objective function $f(x)$ over all $x \in R^n$ subject to general equations $c_i(x) = 0$, ($i \in 1, \dots, m_E$), general inequalities $c_i^l \leq c_i(x) \leq c_i^u$ ($i \in m_E + 1, \dots, m$), 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_cdhj 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,

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,

lh1 [in] - integer

the actual declared size of the leading dimension of H_val (with lh1 no smaller than n),

H_val [out] - real/double precision

a two-dimensional array which gives the value of the Hessian matrix of the John function evaluated at X, y0 and Y.

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,
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.

sifdecoder(1)