NAME

CUTEST_cish – CUTEst tool to evaluate the Hessian of an individual problem function, in sparse format.

SYNOPSIS

CALL CUTEST_cish(status, n, X, iprob, nnzh, lh, H_val, H_row, H_col)

DESCRIPTION

The CUTEST_cish subroutine evaluates the Hessian of a particular constraint function or the objective function for the problem decoded from a SIF file by the script *sifdecoder* at the point X, and possibly its gradient. 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 $c_i^l(x) \le c_i(x) \le c_i^u(x)$, $(i \in m_E + 1, \ldots, m)$, and simple bounds $x^l \le x \le x^u.$ The objective function is group-partially separable and all constraint functions are partially separable.

ARGUMENTS

The arguments of CUTEST_cish 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,

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,

iprob [in] - integer
the number of the problem function to be considered. If iprob = 0, the Hessian of the objective function will be evaluated, while if iprob = i > 0, that of the i-th constraint will be evaluated.

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 required problem 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 required Hessian matrix evaluated at X, and

H_col [out] - integer
an array which gives the column indices of the nonzeros of the required Hessian matrix evaluated at X.

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.

sifdecoder(1).

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