

NAME

CUTEST_ush – CUTEst tool to evaluate the sparse Hessian matrix of the objective function.

SYNOPSIS

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

DESCRIPTION

The CUTEST_ush subroutine evaluates the 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 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,

X [in] - real/double precision

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

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.

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(3M), sifdecoder(1).