

NAME

CUTEST_cchprodsp – CUTEst tool to determine the sparsity structure used when forming the matrix-vector products of a vector with each of the Hessian matrices of the constraint functions.

SYNOPSIS

CALL CUTEST_cchprodsp(status, n, m, lchp, CHP_ind, CHP_ptr)

For real rather than double precision arguments, instead

CALL CUTEST_cchprodsp_s(...)

and for quadruple precision arguments, when available,

CALL CUTEST_cchprodsp_q(...)

DESCRIPTION

The CUTEST_cchprodsp subroutine obtains the sparsity structure used when forming the product of a vector with each of the Hessian matrices of the constraint functions $c(x)$ corresponding to the problem decoded from a SIF file by the script *sifdecoder* at the point $x = X$.

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_cchprodsp 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,

lchp [in] - integer

a variable that specifies the declared lengths of CHP_val and CHP_ind. The precise length required may be found by calling *CUTEST_cdimchp* prior to *CUTEST_cchprodsp*,

CHP_ind [inout] - integer

an array that gives the indices of the nonzeros in the result obtained by multiplying the constraint Hessians by VECTOR. The indices for the i -th constraint are stored in $\text{CHP_ind}(\text{CHP_ptr}(i):\text{CHP_ptr}(i+1)-1)$, and will match the values stored in CHP_val from a cutest_cchprods(3M) call.

CHP_ptr [inout] - integer

an array of length $m+1$ that gives pointers to the starting positions in CHP_ind for the indices of the nonzeros for the product with each Hessian. $\text{CHP_ptr}(m+1)-1$ gives the total space required by CHP_ind.

AUTHORS

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SEE ALSO

CUTEst: a Constrained and Unconstrained Testing Environment with safe threads for mathematical optimization,

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cutest_cdimchp(3M), cutest_cchprods(3M), sifdecoder(1).