NAME

CUTEST_cjprod − CUTEst tool to form the matrix-vector product of a vector with the Jacobian of the constraints, or its transpose.

SYNOPSIS

CALL CUTEST_cjprod(status, n, m, gotj, jtrans, X, VECTOR, lvector, RESULT, lresult)

DESCRIPTION

The CUTEST_cjprod subroutine forms the product of a vector with the Jacobian matrix, or with its transpose, of the constraint functions of the problem decoded from a SIF file by the script *sifdecoder* evaluated at the point 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 $c_i(x) = 0$, $(i \in 1, \ldots, m_E)$, general inequalities $c_i^l(x) \leq c_i(x) \leq c_i^u(x)$, $(i \in m_E + 1, \ldots, m)$, 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_cjprod 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,

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

gotj [in] - logical
a logical variable which specifies whether the first derivatives of the groups and elements have already been set (gotj = .TRUE.) or if they should be computed (gotj = .FALSE.),

jtrans [in] - logical
a logical variable which specifies whether the product should involve the Jacobian (jtrans = .FALSE.) or its transpose (jtrans = .TRUE.),

X [in] - real/double precision
when gotj = .FALSE., the derivatives will be evaluated at X. Otherwise X is not used,

VECTOR [in] - real/double precision
an array which gives the vector whose product with the Jacobian or its transposeis is required,

lvector [in] - integer
the actual declared dimension of VECTOR.

RESULT [out] - real/double precision
an array which gives the result of multiplying the Jacobian or its transpose by VECTOR.

lresult [in] - integer
the actual declared dimension of RESULT.

NOTE

gotj should be set to .TRUE. whenever

(1)
a call has been made to CUTEST_cgr, CUTEST_csgr, CUTEST_cgrdh, CUTEST_csgreh or CUTEST_csgrsh at the current point, or

(2)
a previous call to CUTEST_cjprod, with gotj = .FALSE., at the current point has been made.

Otherwise, it should be set .FALSE.

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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