NAME

CPROD – CUTEr tool to form the matrix-vector product of a vector with the Hessian matrix of the Lagrangian.

By convention, the signs of the Lagrange multipliers V are set so the Lagrangian function can be written as $L(X, V) = f(X) + \prec c(X), V \succ$.

SYNOPSIS

CALL CPROD(N, M, GOTDER, X, LV, V, P, Q)

DESCRIPTION

The CPROD subroutine forms the product of a vector with the Hessian matrix of the Lagrangian function of the problem decoded into OUTSDIF.d at the point X.

ARGUMENTS

The arguments of CPROD are as follows

N [in] - integer
the number of variables for the problem,

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

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

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

LV [in] - integer
the actual declared dimension of V,

V [in] - real/double precision
when GOTDER = .FALSE., the derivatives will be evaluated with Lagrange multipliers V. Otherwise V is not used,

P [in] - real/double precision
an array which gives the vector whose product with the Hessian is required,

Q [out] - real/double precision
an array which gives the result of multiplying the Hessian by P.

NOTE

GOTDER should be set to .TRUE. whenever

(1)
a call has been made to CDH, CSH, CGRDH or CGRSH at the current point, or

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

Otherwise, it should be set .FALSE.

AUTHORS

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SEE ALSO

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, TOMS, **21**:1, pp.123-160, 1995.

uprod(3M).