NAME

CSGR − CUTEr tool to evaluate constraints gradients and gradient of objective/Lagrangian function.

SYNOPSIS

CALL CSGR(N, M, GRLAGF, LV, V, X, NNZJ, LCJAC, CJAC, INDVAR, INDFUN)

DESCRIPTION

The CSGR subroutine evaluates the gradients of the general constraints and of either the objective function or the Lagrangian corresponding to the problem decoded into OUTSDIF.d at the point X, in the constrained programming case. The gradients are stored in a sparse format.

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

ARGUMENTS

The arguments of CSGR are as follows

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

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

GRLAGF [in] - logical
a logical variable which should be set .TRUE. if the gradient of the Lagrangian function is required and .FALSE. if the gradient of the objective function is sought,

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

V [in] - real/double precision
an array which should give the Lagrange multipliers whenever GRLAGF is set .TRUE. but need not otherwise be set,

X [in] - real/double precision
an array which gives the current estimate of the solution of the problem,

NNZJ [out] - integer
the number of nonzeros in CJAC,

LCJAC [in] - integer
the actual declared dimensions of CJAC, INDVAR and INDFUN,

CJAC [out] - real/double precision
an array which gives the values of the nonzeros of the gradients of the objective, or Lagrangian, and general constraint functions evaluated at X and V. The i-th entry of CJAC gives the value of the derivative with respect to variable INDVAR(i) of function INDFUN(i),

INDVAR [out] - integer
an array whose i-th component is the index of the variable with respect to which CJAC(i) is the derivative,

INDFUN [out] - integer
an array whose i-th component is the index of the problem function whose value CJAC(i) is the derivative. INDFUN(i) = 0 indicates the objective function whenever GRLAGF is .FALSE. or the Lagrangian function when GRLAGF is .TRUE., while INDFUN(i) = j > 0 indicates the j-th general constraint function.

AUTHORS

I. Bongartz, A.R. Conn, N.I.M. Gould, D. Orban and Ph.L. Toint

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.

ugr(3M), cgr(3M).