NAME

CSETUP – CUTEr tool to set up the data structures for constrained minimization.

SYNOPSIS

CALL CSETUP(INPUT, IOUT, N, M, X, BL, BU, NMAX, EQUATN, LINEAR, V, CL, CU, MMAX, EFIRST, LFIRST, NVFRST)

DESCRIPTION

The CSETUP subroutine sets up the correct data structures for subsequent computations in the constrained programming case.

ARGUMENTS

The arguments of CSETUP are as follows

INPUT [in] - integer
the unit number for the decoded data; the unit from which OUTSDIF.d is read,

IOUT [in] - integer
the unit number for any error messages,

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

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

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

BL [out] - real/double precision
an array which gives lower bounds on the variables,

BU [out] - real/double precision
an array which gives upper bounds on the variables,

NMAX [in] - integer
the actual declared dimension of X, BL and BU,

EQUATN [out] - logical
a logical array whose i-th component is .TRUE. if the i-th constraint is an equation (i in E) and .FALSE. if the constraint is an inequality (i in I),

LINEAR [out] - logical
a logical array whose i-th component is .TRUE. if the i-th constraint is linear or affine and .FALSE. otherwise,

V [out] - real/double precision
an array which gives the initial estimate of the Lagrange multipliers at the solution of the problem. By convention, the signs of the Lagrange multipliers V are set so the Lagrangian function can be written as $L(X, V) = f(X) + \prec c(X), V \succ$,

CL [out] - real/double precision
an array which gives lower bounds on the inequality constraints,

CU [out] - real/double precision
an array which gives upper bounds on the inequality constraints,

MMAX [in] - integer
the actual declared dimension of EQUATN, LINEAR, CL and CU,

EFIRST [in] - logical
logical variable which should be set .TRUE. if the user wishes the general equations to occur before the general inequalities in the list of constraints. If the order is unimportant, EFIRST should be set to .FALSE.,

LFIRST [in] - logical
a logical variable which should be set .TRUE. if the user wishes the general linear (or affine) constraints to occur before the general nonlinear ones in the list of constraints. If the order is unimportant, LFIRST should be set .FALSE. If both EFIRST and LFIRST are set .TRUE., the linear constraints will occur before the nonlinear ones. The linear constraints will be ordered so that the linear equations occur before the linear inequalities. Likewise, the nonlinear equations will appear before the nonlinear inequalities in the list of nonlinear constraints,

NVFRST [in] - logical
a logical variable which should be set .TRUE. if the user wishes that the nonlinear variables come first. Within the nonlinear variables the smaller set of either the nonlinear objective or nonlinear Jacobian variables appears first.

APPLICATION USAGE

A call to CSETUP must precede calls to other evaluation tools for generally-constrained problems.

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.

usetup(3M).