## NAME
CUTEST_cigr – CUTEst tool to evaluate the gradient of a problem function.

## SYNOPSIS

CALL CUTEST_cigr( status, n, iprob, X, G_val )


For real rather than double precision arguments, instead


CALL CUTEST_cigr_s( ... )


and for quadruple precision arguments, when available,


CALL CUTEST_cigr_q( ... )

## DESCRIPTION
The CUTEST_cigr subroutine evaluates the gradient of either the objective function or a constraint function of the problem decoded from a SIF file by the script *sifdecoder* at the point X, in the constrained minimization case. 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 $c_i^l \leq c_i(x) \leq c_i^{u,}$ $(i \in m_E + 1, \ldots, m)$, 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_cigr 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,

**iprob** [in] - integer
the number of the problem function to be considered. If iprob = 0, the value of the objective function will be evaluated, while if iprob = i > 0, that of the i-th constraint will be evaluated,

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

**G_val** [out] - real/double precision
an array which gives the gradient of problem function iprob evaluated at X.

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## SEE ALSO
*CUTEst: a Constrained and Unconstrained Testing Environment with safe threads*,
   N.I.M. Gould, D. Orban and Ph.L. Toint,
   Computational Optimization and Applications **60**:3, pp.545-557, 2014.


*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), cutest_cisgr(3)