

**NAME**

CUTEst\_usetup\_threaded – CUTEst tool to set up the data structures for unconstrained or bound-constrained minimization.

**SYNOPSIS**

CALL CUTEst\_usetup\_threaded( status, input, out, threads, IO\_BUFFERS, n, X, X\_l, X\_u )

**DESCRIPTION**

The CUTEst\_usetup\_threaded subroutine sets up the correct data structures for subsequent threaded computations in the case where the only possible constraints are bound constraints.

The problem under consideration is to minimize or maximize an objective function  $f(x)$  over all  $x \in R^n$  subject to the simple bounds  $x^l \leq x \leq x^u$ . The objective function is group-partially separable.

**ARGUMENTS**

The arguments of CUTEst\_usetup\_threaded are as follows

**status** [out] - integer

the output status: 0 for a successful call, 1 for an array allocation/deallocation error, 2 for an array bound error, 3 for an evaluation error, 4 for an out-of-range thread,

**input** [in] - integer

the unit number for the decoded data; the unit from which OUTSDIF.d is read,

**out** [in] - integer

the unit number for any error messages,

**threads** [in] - integer

the total number of independent evaluation threads that are required,

**IO\_BUFFERS** [in] - integer

an array of different unit numbers, one entry for each thread, for any internal input/output,

**n** [out] - integer

on input, the declared dimensions of X, X\_l and X\_u (see argument n in CUTEst\_udimen). On output, the number of variables for the problem,

**X** [out] - real/double precision

an array that gives the initial estimate of the solution of the problem,

**X\_l** [out] - real/double precision

an array that gives lower bounds on the variables,

**X\_u** [out] - real/double precision

an array that gives upper bounds on the variables.

**APPLICATION USAGE**

A call to CUTEst\_usetup\_threaded must precede calls to other threaded evaluation tools, except CUTEst\_udimen, for unconstrained and bound constrained problems.

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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.

cutest\_csetup\_threaded(3M), cutest\_udimen(3M), sifdecoder(1).