

NAME

lbbma – CUTER L-BFGS-B test driver

SYNOPSIS

lbbma

DESCRIPTION

The *lbbma* main program test drives L-BFGS-B on SIF problems from the CUTER distribution.

The L-BFGS-B package is a limited-memory algorithm for bound-constrained minimization by Richard Byrd (U. Colorado at Boulder) and P. Lu, Jorge Nocedal. and. C. Zhu (Northwestern U.)

USAGE

The L-BFGS-B file routines.f should be edited to remove the subroutines TIMER, DNRM2, DAXPY, DCOPY, DDOT and DSCAL, and renamed lbfgsb.f. It should then be compiled, and the f resulting file lbfgsb.o placed in (or symbolically linked to) the directory \$MYCUTER/double/bin.

There is no single-precision version.

NOTE

If no LBFGB.SPC file is present in the current directory, the default version is copied from \$CUTER/common/src/pkg/lbfgsb/. Default specifications are as follows:

5 M, the maximum number of variable metric corrections
10000 MAXIT, the maximum number of iterations
-1 IPRINT print level (<0,none,=0,one line/iteration,>1,more detail)
1.0D+7 FACTR, the function accuracy tolerance (see hint below)
1.0D-5 PGTOL, the absolute projected gradient decrease required
Hint - the iteration will stop when

$$(f^k - f^{k+1})/\max\{|f^k|,|f^{k+1}|,1\} \leq \text{factr} * \text{epsmch}$$

where epsmch is the machine precision, which is automatically generated by the code. Typical values for factr: 1.D+12 for low accuracy; 1.D+7 for moderate accuracy; 1.D+1 for extremely high accuracy.

The reader is referred to the paper quoted below and the code itself if he or she wishes to modify these parameters.

ENVIRONMENT

CUTER

Parent directory for CUTER

MYCUTER

Home directory of the installed CUTER distribution.

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

Algorithm 778. L-BFGS-B: Fortran subroutines for large-scale bound constrained optimization, C. Zhu, R. H. Byrd, P. Lu and J. Nocedal ACM TOMS, **23**:4, pp.550-560, 1997.

sdlbb(1), lbb(1).