NAME

stnma – CUTEr STENMIN test driver

SYNOPSIS

stnma

DESCRIPTION

The *stnma* main program test drives STENMIN on SIF problems from the CUTEr distribution.

STENMIN is an optimization package which uses tensor methods to minimize a nonlinear unconstrained problem where the Hessian is large and sparse. The software allows the user to select between a tensor method and a standard method based upon a quadratic model. The tensor method models the objective function by a fourth-order model, where the third- and fourth-order terms are chosen such that the extra cost of forming and solving the model is small.

STENMIN has been written and is distributed by

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USAGE

Compile (but do not link) stenmin.f. The resulting object file stenmin.o should be placed in your directory $MYCUTER/*precision*/bin/.

Starting from the files distributed by A. Bouaricha, perform the following steps on a UNIX system (or equivalent actions on other systems).

1) Use the makefile supplied in the distribution to obtain the double
precision version of the stenmin.f and colmor.f files:

```
f77 -o todble todble.f
make stenmind.f
make colmord.f
```

2) Concatenate these two files:

```
cat colmord.f >> stenmind.f
```

3) In the resulting stenmind.f, remove the BLAS functions DCOPY, DNRM2, DDOT and DSCAL. (CUTEr also uses these BLAS subroutines. They are contained in the CUTEr Fortran file named linpac.f. To avoid multiply defined subroutines when STENMIN is linked with the CUTE tools, the duplicate BLAS subroutines must be removed from STENMIN.)

4) Compile (but do not link) stenmind.f. The resulting object file stenmind.o should be placed in your directory $MYCUTER/*precision*/bin/.

5) You should also have a compiled double precision version of the Harwell Subroutine MA27 named ma27d.o in your directory $MYCUTER/*precision*/bin/. This subroutine is requested by STENMIN.

The steps for obtaining the single precision version of STENMIN are identical, except that the following substitutions should be made:

todble	-->	tosngl
stenmind.f	-->	stenmins.f
colmord.f	-->	colmors.f
DCOPY	-->	SCOPY
DNRM2	-->	SNRM2
DDOT	-->	SDOT
DSCAL	-->	SSCAL
stenmind.o	-->	stenmins.o
ma27d.o	-->	ma27s.o

Note: If you have the Harwell Subroutine Library already available on your system, an additional copy of MA27 is unnecessary. You should edit the file $MYCUTER/bin/stn to set the BLAS variable adequately.

NOTE

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

1000	ILIM,	maximum number of iterations
0.00001	GRADTL,	relative gradient stopping tolerance
2	GRDFLG,	gradient availability & checking flag
2	HSNFLG,	Hessian availability & checking flag
1.0	FSCALE,	typical value of objective function
1.0	TYPX,	typical value of problem variables
1	METHOD,	method used (0=Newton, 1=tensor)
15	NDIGIT,	# accurate digits in function values
1	MSG,	output specifier

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

STENMIN: A software package for large, sparse unconstrained optimization using tensor methods, A. Bouaricha, Preprint MCS-P451-0794, Argonne National Laboratory, Argonne, Illinois, 1994.

Tensor methods for large, sparse unconstrainted optimization using tensor methods, A. Bouaricha, Preprint MCS-P452-0794, Argonne National Laboratory, Argonne, Illinois, 1994.

sdstn(1), stn(1).