

NAME

runcutest – CUTEst interface to solvers.

SYNOPSIS

runcutest --package *pack* [--architecture *arch*] [--single] [--help] [--keep] [--rebuild] [--output *0/1*] [--limit *secs*] [--cfortran] [--debug] [--uncons] [-L*path/to/lib*] [--blas *keyword*] [--lapack *keyword*] [--decode *problem*[*.SIF*]]

DESCRIPTION

runcutest is the CUTEst interface to solvers. It replaces its predecessor CUTer's combination of **runpackage**, *pkg* and **sdpkg**. The command accepts options in short or long form. Any option that is not directly recognized is passed unchanged to the SIF decoder, *sifdecoder*(1).

runcutest reads suitable architecture-dependent environment variables and then compiles and links all the relevant source files and libraries to form an executable of the package *package* running on problem *problem*.

The user has the opportunity to run commands before and after the run if need be. **runcutest** executes the script *package_pre*, if it exists, before the run. Similarly, it executes the script *package_post*, if it exists, after completion of the run.

runcutest Options

You can start runcutest with the following options. An option can be used either in short or long form.

-p, --package *pack*

Specifies the package or solver, *pack* to use. See the section **Currently Supported Packages** below. This is the only mandatory option.

-A, --architecture *arch*

Run the decoder using the architecture *arch*; the architecture is a string of the form machine.system.compiler as specified in the directory \$CUTEST/versions. If no -A option is given, a valid architecture given by the environment variable \$MYARCH will be used, but if \$MYARCH is invalid or empty the decoder will terminate.

-sp, --single

Run *package* in single-precision mode if available. Double precision is the default.

-h, --help

Print a short help message with the available command-line options.

-k, --keep

Keep the generated executable after use. May be useful when solving a particular problem with the same solver with different parameters. Deleting the executable after use is the default.

-r, --rebuild

Force recompilation of the test problem. Default is to reuse object files.

-o, --output *0/1*

Regulates the output level. Verbose mode is -o 1, silent mode is -o 0. Silent mode is the default.

-l, --limit *secs*

Sets a limit of *secs* second on the *package* runtime. Unlimited cputime is the default.

-c, --cfortran

Causes specialized compiler options to be used to specify that the main subroutine of *package* is written in C. This is necessary with some compilers, such as the Intel Fortran Compiler.

-L*path/to/lib*

This option is passed directly to the linker and causes the path *path/to/lib* to be searched for libraries. Useful to specify custom BLAS and LAPACK libraries.

-b, --blas keyword

Overrides usage of the default *linpack* library packaged with CUTEst. Instead, use the BLAS library specified by *keyword*. The keyword *keyword* has one of two forms. The first, *-lmyblas* causes the linker to search for BLAS subprograms in the *libmyblas.a* library. The second, *none*, causes the linker to skip inclusion of any external BLAS. Use the first option if an optimized BLAS library is available on the host system, e.g., the ATLAS BLAS. The second option is useful for packages which already include the necessary BLAS subprograms. Use of *none* may be useful if *package* already includes the BLAS subroutines on which it relies.

-K, --lapack keyword

Overrides usage of the default *linpack* library packaged with CUTEst. Instead, use the LAPACK library specified by *keyword*. The keyword *keyword* has one of two forms. The first, *-lmylapack* causes the linker to search for LAPACK subroutines in the *libmylapack.a* library. The second, *none*, causes the linker to skip inclusion of any external LAPACK. Use the first option if an optimized LAPACK library is available on the host system. The second option is useful for packages which already include the necessary LAPACK subprograms. Use of *none* may be useful if *package* already includes the LAPACK subroutines on which it relies.

-D, --decode problem[.SIF]

Applies the SIF decoder to the problem *problem.SIF* to produce the OUTSDIF.d file and the problem-dependant Fortran subroutines. If this flag is not specified, **runcutest** assumes that the problem has been decoded prior to the call.

-u, --uncons

When *package* is **mx**, the Matlab interface, this option specifies that the problem is unconstrained. This causes the appropriate MEX interface to be compiled and linked. The default is to link with the constrained tools.

additional command-line options

Any command-line option not documented in this manual page and/or in the help message of **runcutest** is passed unchanged to the SIF decoder. See the **sifdecode** manual page for more information.

CURRENTLY SUPPORTED PACKAGES

There are currently interfaces to the following packages:

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See E. G. Birgin, R. Castillo and J. M. Martinez, *Numerical comparison of Augmented Lagrangian algorithms for nonconvex problems*, Computational Optimization and Applications 31, 31-56 (2005).

<http://www.ime.usp.br/~egbirgin/tango/codes.php>

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cgplus

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cobyla

See M.J.D. Powell, *A direct search optimization method that models the objective and constraint functions by linear interpolation*, In Advances in optimization and numerical analysis, Proceedings of the Sixth workshop on Optimization and Numerical Analysis, Oaxaca, Mexico, volume 275 of Mathematics and its Applications, pp 51--67. Kluwer Academic Publishers (1994).

derchk

This package checks the derivatives supplied in the problem SIF file, and is due to Dominique Orban from Ecole Polytechnique de Montreal.

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directsearch

The Direct Search suite provides a variety of pattern search methods for derivative-free optimization and was written by Liz Dolan, Adam Gurson, Anne Shepherd, Chris Siefert, Virginia Torczon and Amy Yates.

http://www.cs.wm.edu/~va/software/DirectSearch/direct_code/

filtersd

See R. Fletcher *A sequential linear constraint programming algorithm for NLP*, SIAM Journal on Optimization, 22(3), pp. 772-79 (2012).

<http://www.coin-or.org/projects/filterSD.xml>

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la04

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<http://www.princeton.edu/~rvdb/loqo/LOQO.html>

matlab

Creates a Matlab binary to allow CUTeSt calls from Matlab. See \$CUTEST/src/matlab/README.matlab to see how to use the binary with Matlab. Note that there is a simplified interface **cutest2matlab** that may be used in preference.

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See J. E. Koontz, R.B. Schnabel, and B.E. Weiss, *A modular system of algorithms for unconstrained minimization*, ACM Transactions on Mathematical Software, 11(4) 419-440 (1985).

vf13

VF13 is a line-search SQP method for constrained optimization by Mike Powell from the University of Cambridge.

<http://www.hsl.rl.ac.uk/archive/index.html>

Interfaces to the obsolete packages *hsl_ve12*, *osl*, *va15*, *ve09* and *ve14* previously supported in CUTeR have been withdrawn.

The packages *derchk*, *gen77/90/c*, *hrb* and *stats* are supplied as part of the CUTeSt distribution and should work "as is". Anyone wishing to use one of remaining packages will need to download and install it first. See the README in the relevant subdirectory of \$CUTEST/src for further instructions.

A file with each of supported package's name may be found in the directory \$CUTEST/packages/ and indicates default locations for the package's binary and options files. These files may be edited if necessary, or copied into \$CUTEST/packages/(architecture)/(precision)/ to allow for architecture or precision specific settings; **runcutest** will use the architecture/precision specific directory version, if any, in preference to the default version.

ENVIRONMENT

CUTEST

Directory containing CUTeSt.

SIFDECODE

Directory containing SIFDecode.

MYARCH

The default architecture.

MASTSIF

A pointer to the directory containing the CUTeSt problems collection. If this variable is not set, the current directory is searched for *problem.SIF*. If it is set, the current directory is searched first, and if *problem.SIF* is not found there, \$MASTSIF is searched.

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.

sifdecoder(1), cutest2matlab(1).

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DESCRIPTION

runcutest is the CUTEst interface to solvers. It replaces its predecessor CUTer's combination of **runpackage**, *pkg* and **sdpkg**. The command accepts options in short or long form. Any option that is not directly recognized is passed unchanged to the SIF decoder, `sifdecoder(1)`.

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Print a short help message with the available command-line options.

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Keep the generated executable after use. May be useful when solving a particular problem with the same solver with different parameters. Deleting the executable after use is the default.

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Force recompilation of the test problem. Default is to reuse object files.

-o, --output *0/1*

Regulates the output level. Verbose mode is **-o 1**, silent mode is **-o 0**. Silent mode is the default.

-l, --limit *secs*

Sets a limit of *secs* second on the *package* runtime. Unlimited cputime is the default.

-c, --cfortran

Causes specialized compiler options to be used to specify that the main subroutine of *package* is written in C. This is necessary with some compilers, such as the Intel Fortran Compiler.

-L*path/to/lib*

This option is passed directly to the linker and causes the path *path/to/lib* to be searched for libraries. Useful to specify custom BLAS and LAPACK libraries.

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<https://projects.coin-or.org/Dfo>

directsearch

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Interfaces to the obsolete packages *hsl_ve12*, *osl*, *va15*, *ve09* and *ve14* previously supported in CUTeR have been withdrawn.

The packages *derchk*, *gen77/90/c*, *hrb* and *stats* are supplied as part of the CUTeSt distribution and should work "as is". Anyone wishing to use one of remaining packages will need to download and install it first. See the README in the relevant subdirectory of \$CUTEST/src for further instructions.

A file with each of supported package's name may be found in the directory \$CUTEST/packages/ and indicates default locations for the package's binary and options files. These files may be edited if necessary, or copied into \$CUTEST/packages/(architecture)/(precision)/ to allow for architecture or precision specific settings; **runcutest** will use the architecture/precision specific directory version, if any, in preference to the default version.

ENVIRONMENT

CUTEST

Directory containing CUTeSt.

SIFDECODE

Directory containing SIFDecode.

MYARCH

The default architecture.

MASTSIF

A pointer to the directory containing the CUTeSt problems collection. If this variable is not set, the current directory is searched for *problem.SIF*. If it is set, the current directory is searched first, and if *problem.SIF* is not found there, \$MASTSIF is searched.

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.

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I. Bongartz, A.R. Conn, N.I.M. Gould and Ph.L. Toint,
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sifdecoder(1), cutest2matlab(1).