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If you want to use the program package LINSOL as stand-alone package, i.e.
the matrix, the right hand side and the initial guess (if existing) are
read from files and the solution is written to another file,
PLEASE READ first the manual page LINSOL.

If you want to embed the program package LINSOL into your application,
PLEASE READ first the manual page LSOLP and the manual page MATRIX.


Referencing the URL http://www.rz.uni-karlsruhe.de/~ne03/literatur.html you
find literature related to LINSOL. Especially the report

   LINSOL (LINear SOLver) - Description and User's Guide for the
                            parallelized version

describes the methods used in LINSOL.


The manual pages are in the directory 'LINSOL/man3'.
In the manual page LINSOL you will find a description how to use the
LINSOL interface that can be called by invoking the shell script >linnnox.
In the manual page LSOLP you will find a description how to use the LSOLP
interface that can be called by serial or parallel application programs.
In the manual page MATRIX you will find a description of the structure of
the matrix used by LINSOL.
The manual page LINSOL_FILE_FORMAT explains the LINSOL fileformat that is
optimally adapted to the data structures used in the program package LINSOL.
The manual page RHS_SOLUTION_FILE_FORMAT explains the fileformat of the
right hand side(s), the initial guess(es) and the solution(s) used in
the program package LINSOL.


Using LINSOL as stand-alone package
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1. Extend the environment variable PATH (e.g. in the configuration file
   $HOME/.profile) by the path to the shell scripts 'linnox' and 'linsh'.
   (If you have installed the program package LINSOL by yourself, you will
    find these files in the directory 'LINSOL/bin'.)
2. Copy the parameter files 'gre512_param' and/or 'oilgen_param' from the
   directory 'LINSOL/examples' or from the LINSOL web side into a newly-
   created directory.
3. Copy the matrices 'gre512.rua' and/or 'oilgen.lsol' from the
   directory 'LINSOL/examples/matrices' or from the LINSOL web side into
   a newly-created subdirectory matrices within the created
   directory (from point 2).
4. Set the environment variable LINSOL_FILES_DIR (e.g. in the configuration
   file $HOME/.profile) to the path of the created directory (from point 2)
   and export the variable.
5. Go into the directory (from point 2) and call
   > linnox gre512_param
   If the program package LINSOL runs sucessfully (the relative errors
   printed at the end of the output should be less than 10**(-6)!),
   you can adapt the parameter file 'gre512_param' to the matrix you want
   to use and then run LINSOL again by calling > linnox ...
   The parameters used in the parameter files are described in the manual
   page LINSOL.


Embedding LINSOL into your aplication
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1. Copy the programs 'exam01.f' and 'exam01s.f' from the directory
   'LINSOL/examples' or from the LINSOL web side into a newly-created
   directory. Both programs are written in FORTRAN90 and solve small
   linear systems of equations.
2. Compile e.g. the program 'exam01.f by calling
   > <F90-compilername> -o exam01 -L<directory_path_to_LINSOL_library> \
     -llinsol -lnocomm exam01.f
3. Run the programs by calling
   > exam01
   or
   > exam01s
   Both programs run sucessfully, if each solution x is x={1,2,3,4,5,6,7,8}
   with rounding errors.
4. Read the manual pages LSOLP and MATRIX and take a look on the source codes
   of the programs 'exam01.f' and 'exam01s.f'.
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   The manual page LSOLP describes the parameters of the parameter list
   of the FORTRAN90 interface LSOLP. The manual page MATRIX describes the
   structure of the matrix you can hand over to the program package called
   by the subroutine call LSOLP.
5. If you have understood the matrix structure used by LINSOL and LSOLP
   respectively, you can embed the interface LSOLP in your program. Probably
   you have to adapt the matrix structure used in your program to one of the
   basic storage patterns of the matrix that are supported by LINSOL.
   If you call the FORTRAN90 interface LSOLP from a C program please look
   into the C User's Guide of your platform for interlanguage calls.
6. Link your serial program with the linker options
   -L<directory_path_to_LINSOL_library> -llinsol -lnocomm
   and your parallel program with the linker options
   -L<directory_path_to_LINSOL_library> -llinsol -lMPI   !!!



   Good luck
   Hartmut Haefner


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if you run into troubles you can not get over!
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