

ZIMPL

Zuse Institute Mathematical Programming Language

(<http://zimpl.zib.de/>)

„Zimpl is a little language to translate the mathematical model of a problem into a linear or (mixed-) integer mathematical program expressed in .lp or .mps file format which can be read and (hopefully) solved by a LP or MIP solver.“

Ein lineares Programm: min $2x + 3y$
 $x + y \leq 6$
 $x, y \geq 0$

Im LP Format: Minimize
 Cost: +2 x +3 y
 Subject to
 c1: +1 x +1 y <= 6
 End

Mit ZIMPL: var x;
 var y;
 minimize cost: 2 * x + 3* y;
 subto c1: x + y <= 6;

Weiteres Beispiel: min $2x_1 + 3x_2 + 1.5 x_3$
 subject to $\sum_i x_i \leq 6$
 $x_i \geq 0$

```
set I          := { 1 to 3 };
param c[I]     := <1> 2, <2> 3, <3> 1.5;
var x[I]       >= 0;
minimize cost: sum <i> in I : c[i] * x[i];
subto cons: sum <i> in I : x[i] <= 6;
```

Aufruf:

```
/usr/local/zibopt/bin/zimpl -t hum example.zpl
```

```
zimpl [option] <input-files>
```

-t *format* Selects the output format. Can be either lp, which is default, or mps, or hum, which is only human readable, or rlp, which is the same as lp but with rows and columns randomly permuted. The permutation is depending on the seed.

SoPlex

The Sequential object-oriented simplex

(<http://soplex.zib.de/>)

“SoPlex is an implementation of the revised simplex algorithm. It features primal and dual solving routines for linear programs and is implemented as a C++ class library that can be used with other programs. An example program to solve standalone linear programs given in MPS or LP format files is also included.”

Aufruf:

```
/usr/local/zibopt/bin/soplex example.lp
```

```
/usr/local/zibopt/bin/soplex -help
```

usage: /usr/local/zibopt/bin/soplex [options] LPfile [Basfile]

LPfile can be either in MPS or LPF format

options: (*) indicates default

(!) indicates experimental features which may give wrong results

- e select entering algorithm (default is leaving)
- r select row wise representation (default is column)
- i select Eta-update (default is Forest-Tomlin)
- x output solution vector (works only together with -s0)
- q display solution quality
- br read file with starting basis from Basfile
- bw write file with optimal basis to Basfile

usw....

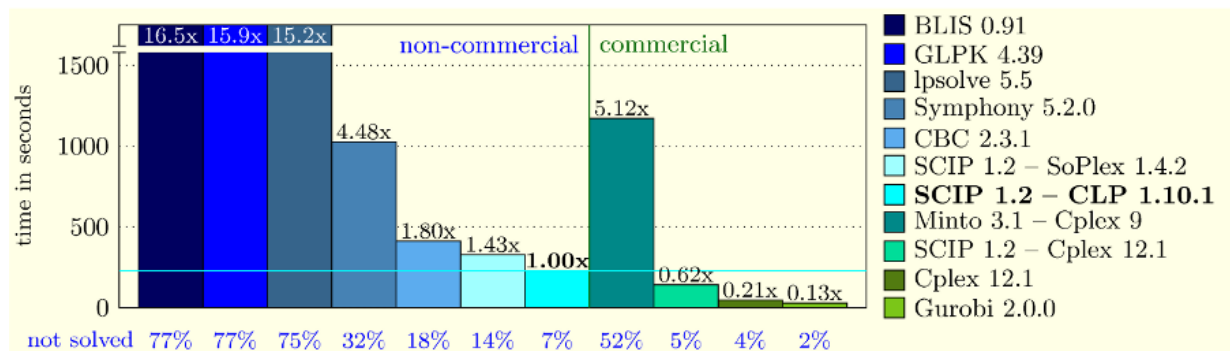
SCIP

Solving Constraint Integer Programs

(<http://scip.zib.de/>)

„SCIP is currently one of the fastest non-commercial mixed integer programming solver. It is also a framework for Constraint Integer Programming and branch-cut-and-price. It allows total control of the solution process and the access of detailed information down to the guts of the solver.“

Dazu:



Geometric mean of results taken from the homepage of [Hans Mittelmann](#) (10/07/2009).
Unsolved or failed instances are accounted for with the time limit of 2 hours.

Aufruf:

```
/usr/local/zibopt/bin/scip -f example.lp
```

syntax: /usr/local/zibopt/bin/scip [-l <logfile>] [-q] [-s <settings>] [-f <problem>] [-b <batchfile>] [-c "command"]

-l <logfile> : copy output into log file

-q : suppress screen messages

-s <settings> : load parameter settings (.set) file

-f <problem> : load and solve problem file

-b <batchfile>: load and execute dialog command batch file (can be used multiple times)

-c "command" : execute single line of dialog commands (can be used multiple times)