COIN OR Project (Computational Infrastructure for Operations Research)

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Overview

CLP for Linear Programming

- Installation
- Overeview
- Usage
- Basic examples

Background

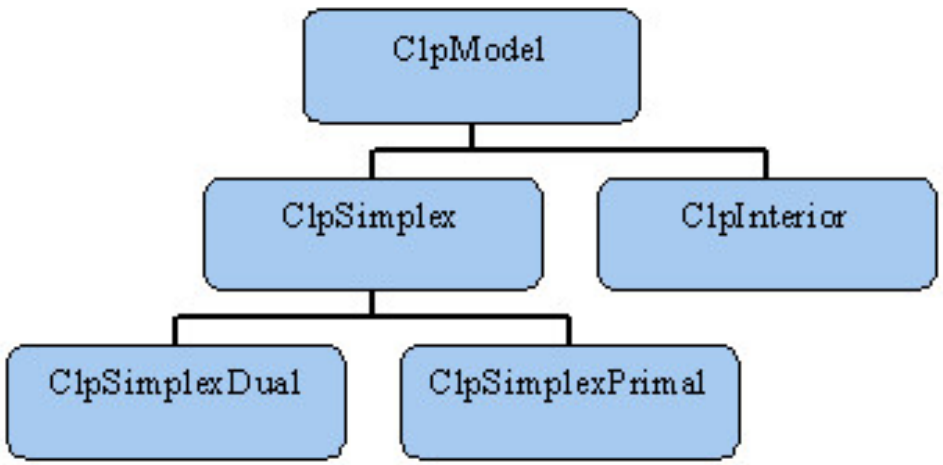
Clp is written in C++ and is released as open source code under the Eclipse Public License (EPL). It is available from the COIN-OR initiative. The code is written primarily by John J. Forrest, now retired from IBM Research. The project is currently managed by John Forrest, Julian Hall, and the rest of the Clp team.
The latest stable version is 1.16.

Installation

1. svn co https://projects.coin-or.org/svn/Clp/stable/1.16 coin-Clp
2. cd coin-Clp
3. ./configure -C
4. make
5. make test
6. make install

Basic model classes

The top three levels of the hierarchy are depicted in the figure below. The first two levels (i.e. ClpModel, ClpSimplex, ClpInterior) contain all the problem data which define a model (that is, a problem instance). The third level contains most of the algorithmic aspects of CLP.



```
#include "ClpSimplex.hpp"

int main (int argc, const char *argv[])
{
  ClpSimplex  model;
  int status;
  if (argc < 2)
    status=model.readMps("dovetail.mps");
  else
    status=model.readMps(argv[1]);
  if (!status) {
    model.primal();
  }
  return 0;
}
```

examples/simplex_minimum.cpp

MPS format

```
   NAME          DOVETAIL
ROWS
 N  obj
 L  c1
 L  c2
 L  c3
 L  c4
COLUMNS
    MARK0000  'MARKER'                 'INTORG'
    x1        obj             3        c1              1
    x1        c2              3        c3              1
    x2        obj             2        c1              1
    x2        c2              1        c4              1
    MARK0001  'MARKER'                 'INTEND'
RHS
    RHS       c1              9        c2             18
    RHS       c3              7        c4              6
BOUNDS
 LO BND       x1              0
 LO BND       x2              0
ENDATA
```

Solution inspection

- double * model.primalColumnSolution();
- double * model.primalRowSolution();
- bool model.isProvenOptimal();
- bool model.isProvenPrimalInfeasible();
- bool model.isProvenDualInfeasible();
- bool model.isIterationLimitReached();

Other useful methods

Set methods

- model.setMaximumIterations(int value);
- model.setMaximumSeconds(double value);
- model.setDualBound(double value);
- model.setOptimizationDirection(double value);

Get methods

- model.numberRows();
- model.numberColumns();
- model.objectiveValue();
- model.objective();

Bullet Points