

Optimization Solvers

- **Free and open-source software**

SciPy- a general numeric package for Python, with some support for optimization.

- **Commercial software**

CPLEX – integer, linear and quadratic programming.

AMPL – modelling language for large-scale linear, mixed integer and nonlinear optimization

Gurobi – integer, linear and quadratic programming.

Maple – linear, quadratic, and nonlinear, continuous and integer optimization. Constrained and unconstrained. Global optimization with add-on toolbox.

MATLAB – linear, integer, quadratic, and nonlinear problems with Optimization Toolbox; multiple maxima, multiple minima, and non-smooth optimization problems; estimation and optimization of model parameters.

- **free for academic use**

AIMMS, AMPL, CPLEX, GEKKO Python, Gurobi

https://en.wikipedia.org/wiki/List_of_optimization_software

Example: Online-optimizer

$$\begin{aligned} & \text{Min} \quad 3x_1 + 2x_2 \\ & \text{subject to} \\ & \quad x_1 + x_2 \leq 9 \\ & \quad 3x_1 + x_2 \leq 18 \\ & \quad x_1 \leq 7 \\ & \quad x_2 \leq 6 \\ & \quad x_1, x_2 \geq 0 \end{aligned}$$

<https://online-optimizer.appspot.com/?model=builtin:default.mod>

Where to find the CPLEX examples

https://www.ibm.com/support/knowledgecenter/SSSA5P_12.8.0/ilog.odms.ide.help/OPL_Studio/user_examples/topics/opl_mp_examples_where.html

https://www.ibm.com/support/knowledgecenter/SSSA5P_12.8.0/ilog.odms.studio.help/Optimization_Studio/topics/COS_home.html

CPLEX

https://www.ibm.com/support/knowledgecenter/SSSA5P_12.8.0/ilog.odms.studio.help/Optimization_Studio/topics/COS_home.html

CVX-MATLAB

<http://cvxr.com/cvx/>