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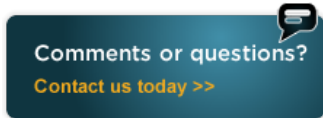


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AMPL

The AMPL system is a sophisticated modeling tool that supports the entire optimization modeling lifecycle: development, testing, deployment, and maintenance.

By using a high-level representation that represents optimization models in the same ways that people think about them, AMPL promotes rapid development and reliable results.

AMPL integrates a modeling language for describing optimization data, variables, objectives, and constraints; a command language for browsing models and analyzing results; and a scripting language for gathering and manipulating data and for implementing iterative optimization schemes. All use the same concepts and syntax for streamlined application-building.

Powerful modeling language features

- *Broad support for sets and set operators.* AMPL models can use sets of pairs, triples, and longer tuples; collections of sets indexed over sets; unordered, ordered, and circular sets of objects; and sets of numbers.
- *General and natural syntax* for arithmetic, logical, and conditional expressions; familiar conventions for summations and other iterated operators.
- *Automatic handling of linear and convex quadratic problems* in continuous and integer variables.
- *Nonlinear programming features* such as initial primal and dual values, user-defined functions, fast automatic differentiation, and automatic elimination of “defined” variables.
- *Convenient alternative notations* for network flows, piecewise-linearities, complementarity conditions, and logical implications.

Valuable modeling support features

- *Interactive command environment* with batch processing options. Powerful display commands let you view any model component or expression, browsing on-screen or writing to a file, using automatic formatting or your own preferences.
- *Powerful scripting language* including looping and if-then-else commands. Programs in the AMPL command language can define sophisticated iterative schemes that process input data, repeatedly adjust and solve instances of multiple models, and prepare results for analysis.
- *Separation of model and data.* AMPL models remain concise even as sets and data tables grow. Models may incorporate many kinds of conditions for validity of the data.
- *Data input and output connections.* Concise statements relate the model data and results to the contents of relational data tables.

Broad availability

Available [solvers](#) include the most popular and powerful optimization engines:

- *Linear and convex quadratic solvers* for both continuous and mixed-integer problems (CPLEX, Gurobi, Xpress).
- *Nonlinear solvers* for local solution of continuous problems (CONOPT, Ipopt, KNITRO, MINOS, SNOPT) and mixed-integer problems (Bonmin, Couenne, KNITRO).

Hook your own solver to AMPL using our open-source AMPL-solver library.

Supported [platforms](#) include Windows, Linux, MacOS, and several Unix-based workstations.

Extensive supporting materials

The [AMPL book](#) provides a detailed introductory tutorial plus tutorial introductions to all basic and advanced features.

Numerous [examples](#) are available including all models and data from the AMPL book as well as a variety of scripts for common iterative schemes.

The AMPL [user forum](#) on Google groups is open to the public for searching or posting.

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