

GAMS

Optimization

www.gams.com

Support

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Solvers

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Model Library

gamsworld.org

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High-Level Modeling

The General Algebraic Modeling System (GAMS) is a **high-level modeling system** for mathematical programming problems. GAMS is tailored for complex, large-scale modeling applications, and allows you to build large maintainable models that can be adapted quickly to new situations. Models are **fully portable** from one computer platform to another.

Wide Range of Model Types

GAMS allows the formulation of models in many different problem classes, including

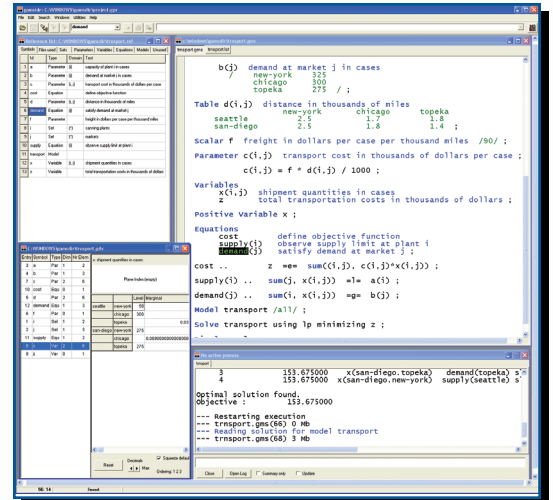
- Linear (LP) and Mixed Integer Linear (MIP)
- Quadratic Programming (QCP) and Mixed Integer QCP (MIQCP)
- Nonlinear (NLP) and Mixed Integer NLP (MINLP)
- Constrained Nonlinear Systems (CNS)
- Mixed Complementary (MCP)
- Programs with Equilibrium Constraints (MPEC)
- Conic Programming Problems
- Stochastic Linear Problems

MINLP and Global Solvers in GAMS

The area of Mixed Integer Nonlinear Programming (MINLP) and Global Optimization has experienced significant growth in industry and academia over the last years. More and more general purpose solution algorithms have been implemented and have matured into reliable solution systems:

- **AlphaECP**^Δ: Extended cutting plane method from Åbo Akademi University, Finland
- **BARON**: Branch-And-Reduce Optimization Navigator for proven global solutions from The Optimization Firm
- **Bonmin**^Δ: Hybrid outer-approximation based branch-and-cut algorithm jointly developed by a collaboration between Carnegie Mellon University and the IBM Corporation and distributed from COIN-OR
- **DICOPT**: Outer approximation framework from Carnegie Mellon University
- **LGO**: Lipschitz global optimizer from Pinter Consulting Services, Inc.
- **LINDOglobal**^Δ: A branch-and-bound solver for proven global solutions from Lindo Systems, Inc.
- **MSNLP/OQNLP**: Multi-start method for global optimization from Optimal Methods, Inc.
- **SBB**: Branch-and-Bound algorithm from ARKI Consulting & Development A/S

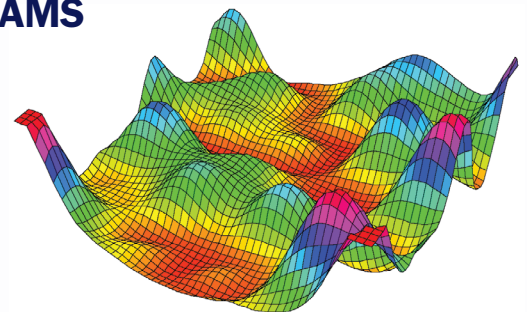
^Δ New in GAMS 22.5.



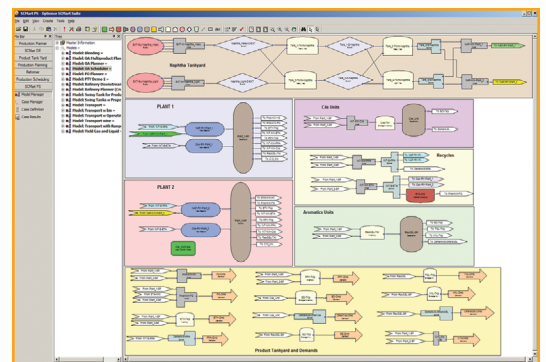
GAMS Integrated Developer Environment for editing, debugging and solving models and viewing data.

State-of-the-Art Solvers

GAMS incorporates all major commercial and academic **state-of-the-art solution technologies** for a broad range of problem types, including global nonlinear optimization solvers.



Surface of a function with multiple local optima.
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Screenshot from SCart Suite deploying MINLP models from Optience Corp.