



Solvers and Model Types

|             | LP/MIP | MIQCP | NLP | MINLP | CNS | MCP | MPEC | Stoch | Global |
|-------------|--------|-------|-----|-------|-----|-----|------|-------|--------|
| ALPHAEC     |        | ✓     |     | ✓     |     |     |      |       |        |
| ANTIGONE    |        | ✓     | ✓   | ✓     | ✓   |     |      |       | ✓      |
| BARON       | ✓      | ✓     | ✓   | ✓     | ✓   |     |      |       | ✓      |
| BDMLP       | ✓      |       |     |       |     |     |      |       |        |
| COIN-OR     | ✓      | ✓     | ✓   | ✓     |     |     |      |       | ✓      |
| CONOPT      |        |       | ✓   |       | ✓   |     |      |       |        |
| CPLEX (p)   | ✓      | ✓     |     |       |     |     |      |       |        |
| DECIS       |        |       |     |       |     |     |      | ✓     |        |
| DICOPT      |        | ✓     |     | ✓     |     |     |      |       |        |
| GLOMIO      |        | ✓     |     |       |     |     |      |       | ✓      |
| GUROBI (p)  | ✓      |       |     |       |     |     |      |       |        |
| IPOPT       |        |       | ✓   |       | ✓   |     |      |       |        |
| KNITRO (p)  |        |       | ✓   | ✓     |     |     |      |       |        |
| LGO         |        |       | ✓   |       |     |     |      |       | ✓      |
| LINDO       | ✓      | ✓     | ✓   | ✓     |     |     |      | ✓     | ✓      |
| LINDOGLOBAL | ✓      | ✓     | ✓   | ✓     |     |     |      |       | ✓      |
| LOGMIP      | ✓      |       |     | ✓     |     |     |      |       |        |
| MILES       |        |       |     |       |     | ✓   |      |       |        |
| MINOS       |        |       | ✓   |       | ✓   |     |      |       |        |
| MOSEK (p)   | ✓      | ✓     | ✓   |       |     |     |      |       |        |
| MSNLP       |        |       | ✓   |       |     |     |      |       | ✓      |
| NLPEC       |        |       |     |       |     |     | ✓    |       |        |
| OQNLP       |        |       | ✓   | ✓     |     |     |      |       | ✓      |
| PATH        |        |       | ✓   |       | ✓   | ✓   |      |       |        |
| SBB         |        | ✓     |     | ✓     |     |     |      |       |        |
| SCIP        | ✓      | ✓     | ✓   | ✓     | ✓   |     |      |       | ✓      |
| SNOPT       |        |       | ✓   |       | ✓   |     |      |       |        |
| SULUM       | ✓      |       |     |       |     |     |      |       |        |
| XA (p)      | ✓      |       |     |       |     |     |      |       |        |
| XPRESS (p)  | ✓      | ✓     |     |       |     |     |      |       |        |

(p) = supports parallel solver threads

The GAMS Base module includes the GAMS language compiler and execution system, GAMSIDE (Windows), system documentation, model libraries, CONVERT tools, UNIX and GDX utilities, connectivity tools and API's, COIN-OR, GUSS, LOGMIP, JAMS, MILES, NLPEC, and all other solvers in limited versions.

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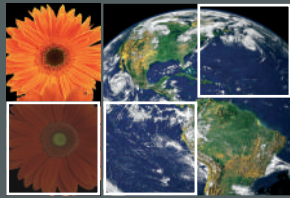
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**General Algebraic Modeling System**

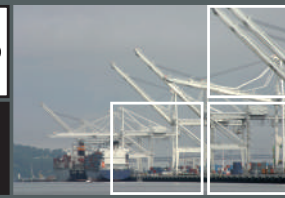
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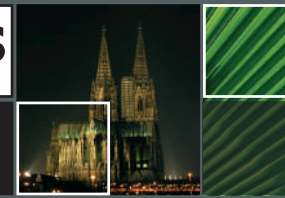
# GAMS



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## General Algebraic Modeling System (GAMS)

The General Algebraic Modeling System (GAMS) is a high-level algebraic modeling system for large scale optimization.

### Key Features

- Robust, scalable state-of-the-art modeling technology
- Tailored for complex, large-scale modeling applications
- Productivity gains through rapid development environment
- Broad academic and commercial network
- 30+ years of experience in industry and academia

## System Overview and Features

The modeling and optimization framework is based on an **open architecture**, which allows **seamless communication** with integrated components (e.g. optimization solvers) and external systems.

GAMS applications are **fully portable** across platforms (including Windows, Linux, Mac OS X, AIX, Solaris, ...).

GAMS provides a one-of-a-kind solver portfolio with **all major commercial and academic state-of-the-art solvers** and also solvers for **stochastic and global optimization**.

### Basic Model Types

- Mixed Integer Linear/Quadratic Programs (MIP/MIQCP)
- Mixed Integer Nonlinear Programs (MINLP)
- Mixed Complementarity Problems (MCP)
- Mathematical Programs with Equilibrium Constraints (MPEC)
- Constrained Nonlinear Systems (CNS)
- Extended Mathematical Programming (EMP)

GAMS' **open architecture** assures a **smooth integration of optimization models** into all kinds of application environments.

### Interfaces and Connectivity Tools

- Interactive and batch oriented model execution
- Distributed execution (Grid computing)
- Data exchange with DBMS, MS-Office, Matlab, ...
- Component library with interfaces to C++, Java, .NET, Python...

GAMS provides all the tools a modeler needs for **fast and reliable development and deployment**.

### Productivity Tools

- Model development with the integrated development environment (GAMSIDE)
- Integrated data browser and charting engine
- Profiling tools for performance issues
- Data and model encryption
- Grid computing
- MPSGE for general equilibrium modeling
- Extensive application model library (> 380 models!)
- Additional model libraries: Datalib, EMPLib, FINlib and Testlib
- Benchmarking and deployment tools
- EMP - a framework for automated mathematical programming reformulations
- Scenario Solver (GUSS)

GAMS is dedicated to **performance and reliability**. We started [www.gamsworld.org](http://www.gamsworld.org) and our own software quality assurance program to address and improve the quality of the GAMS system and the integrated optimization solvers.

### Software Quality Assurance

- Solver testing
- Extensive test model library for GAMS language
- Client model testing
- Transparent and reproducible for any GAMS user

A **free demo version** of GAMS with all solvers is available at: <http://www.gams.com/download>

