Rapid Application Prototyping With GAMS

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GAMS at a Glance

General Algebraic Modeling System

- Roots: World Bank, 1976
- Went commercial in 1987
- GAMS Development Corp.
- GAMS Software GmbH
- Broad academic & commercial user community and network
GAMS at a Glance

Algebraic Modeling System

- Facilitates to formulate mathematical optimization problems similar to algebraic notation

  ➔ Simplified model building

- Provides links to appropriate state-of-the-art external algorithms

  ➔ Efficient solution process
GAMS at a Glance

**General Algebraic Modeling System**

- Algebraic Modeling Language
- 25+ Integrated Solvers
- 10+ Supported MP classes
- 10+ Supported Platforms
- Connectivity- & Productivity Tools
  - IDE
  - Model Libraries
  - GDX, Interfaces & Tools
  - Grid Computing
  - Benchmarking
  - Compression & Encryption
  - Deployment System
  - …
GAMS at a Glance

25+ Integrated Solvers

- XA
- XPRESS
- COIN-OR
- BDMLP
- CPLEX
- MOSEK
- GUROBI
- BARON
- CONOPT
- LGO
- LINDOGLOBAL
- DICOPT
- ALPHAEC
- CONOPT
- MOSEK
GAMS at a Glance

10+ Supported MP classes

- CNS
- MCP
- QCP
- MINLP
- LP
- NLP
- DNLP
- MIQCP
- MPEC
- MIP
- LP
- NLP
GAMS at a Glance

10+ Supported Platforms

Solaris 64bit
Solaris
AXU
AIX
Linux 64bit
Mac
Windows 64bit
Windows
Linux
GAMS’ Fundamental concepts

• Platform independence

• Open architecture and interfaces to other systems

• Balanced mix of declarative and procedural elements
  – Declaration of Sets, Parameters, Variables, Equations, Models, …
  – Procedural Elements like loops, if-then-else, …

• Layers of separation
Deployed models have often 15+ years lifecycle
  – Changing environment (Hardware, OS, Interface)
  – Improving solver technology

→ Different layers with separation of
  – model and data
  – model and solution methods
  – model and operating system
  – model and interface
GAMS’ Fundamental concepts

→ Models benefit from
  – Advancing hardware
  – Enhanced / new solver technology
  – Improved / upcoming interfaces to other systems

→ Backward compatibility

→ Protection of user investments
What’s new? (GAMS 22.1 Beta)

**New Platform**
- Intel Mac 64 Bit

**New Solver**
- CoinCouenne

**New solver binaries**
- CoinCbc 2.3
- CoinGlpk 4.37
- CoinIpopt 3.6
- Gurobi 1.1
- Knitro 6.0
- Mosek 5.0 rev 127
Welcome to the Daily SuDoku!

Today’s SuDoku is shown on the right. Click the grid to download a printable version of the puzzle. Visit the archive for previous daily puzzles and solutions. Play online, print a Sudoku, solve and get hints using the new improved Draw/Play function.

But how do I do it?

The object is to insert the numbers in the boxes to satisfy only one condition: each row, column and 3x3 box must contain the digits 1 through 9 exactly once. What could be simpler?

The rules of the new Monster Sudoku are exactly the same, but more numbers and letters are needed.

Daily SuDoku: Thu 2-Nov-2006 very hard
Christmas Tree Sudoku

Daily Seasonal Sudoku: Fri 23-Dec-2005

Instructions

Christmas tree Sudoku: Fri 23-Dec-2005

very hard
Samurai Sudoku

The classic free merged grid Samurai Sudoku. We have one free puzzle each week and three additional weekly puzzles for registered users. See below for previous puzzles.

We also have a printable blank Gattai-5 grid for those of you who want to print out some copies to work on.

Free Samurai #33 (Easy)

Access key:

To access the premium Samurais, you will need to enter an access key in the box above. The same key will also let you access our Shogun, Shusu and Wombu puzzles and use both the samurai and standard solvers as many times as you like.

To obtain an access key:
Click the "Buy now!" button below to use secure PayPal pages to purchase an access key. Each key costs £2.00 and is valid for 14 days. The key will be sent to you by email. We will only use your email address to administer this service, and will not pass your details to any third party.

Buy Now
GAMS in Control

GAMS Model

Direct GDX Interface

External Database

Import

Direct GDX Interface

External Database

Export

GUIs
Application in Control

GAMS

Creating Input
GDX Container
GDX API

Call GAMS
GAMS (Executable / DLL)

Reading Solution
GDX Container
GDX API
Calling GAMS from an Application

Creating Input for GAMS Model
Callout to a GAMS Process/Executable
Reading Output from GAMS Model

• Works from basically every environment
  – Web application (server side)
  – Application Builder
    • Oracle, Eclipse, .NET, …
    • Regular Programming language C++, Java, VB, …
  – MS Office Application / VBA

• Integrates with existing user IT infrastructure
Interfacing with MS Office / VBA
Contacting GAMS

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