



# ➤ OPTIMIZATION

www.gams.com ◀

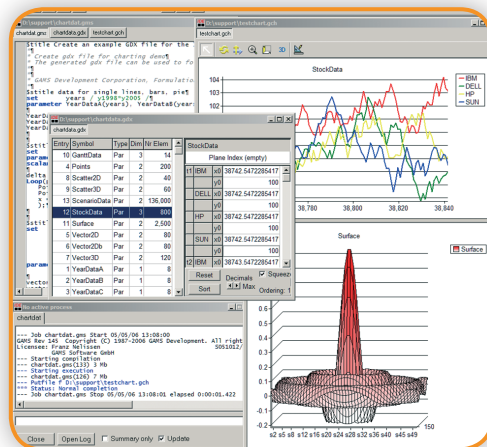
# GAMS

## 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.

## 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.

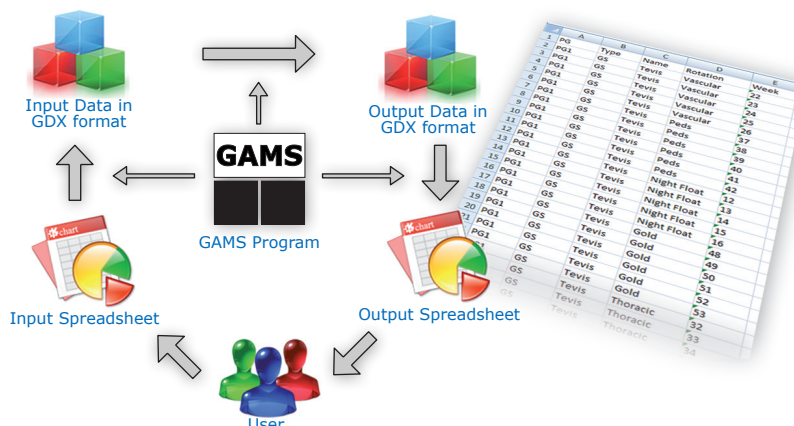


GAMS Integrated Developer Environment for editing, debugging, solving models, and viewing data.

## Resident Rotation Scheduling at the UW Surgery Department

After completing entry-level education in medical schools, newly graduated students are required to undertake a period (5 years) of supervised on-the-job training (called residency) in teaching hospitals or academic medical centers. These students (residents) have to undergo a series of clinically-based trainings (rotations) in various specialty areas. The duration of a rotation usually spans a block of consecutive weeks and it depends on the post-graduate year (PGY) of the resident. A schedule basically establishes the resident-week-rotation relationships that satisfy various training and staffing requirements and certain regulatory restrictions.

- The surgery department's 2010-2011 Rotation Schedule involved 68 residents spanning all five PGYs. Each resident is to be scheduled among 26 rotations of 4 to 13 blocks.
- Depending on the resident's PGY and Type (specialty), some rotations are mandatory, some are preferred, some are flexible and others are impossible, whereas certain rotations might require multiple blocks of attendance.
- Each rotation has very specific staffing requirements which, on a weekly basis, specifies how many residents of each PGY they need and prefer. If the needed residents are not available, surrogates have to be found (hired).
- The model is implemented in GAMS and the procedure is fully automated. The input data and the resulting schedule is maintained in a spreadsheet.
- The model was tested against the surgery department's 2010-2011 rotation schedule. The result matches very closely with the real schedule. The model running time is comfortably short (within 10 minutes).



**For more information about this application** please contact Michael Ferris <ferris@cs.wisc.edu> or Robert McDonald <mcdonald@surgery.wisc.edu>.

### Europe

**GAMS Software GmbH**

Eupener Strasse 135-137

50933 Cologne, Germany

phone

+49-221-949-9170

fax

+49-221-949-9171

mail

info@gams.de

web

http://www.gams.com

### USA

**GAMS Development Corporation**

1217 Potomac Street, NW

Washington, DC 20007, USA

phone

+1-202-342-0180

fax

+1-202-342-0181

mail

sales@gams.com

web

http://www.gams.com