

## GAMS Newsletter Number 9

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### GAMS 20.6 new release

GAMS Corporation has recently released versions 20.6 and maintenance release 20.7 that added some solvers and expanded some language capability. Release notes for 20.6 are on the GAMS web site (<http://www.gams.com/docs/release/release.htm#20.6>). Within this new release there are solver, spreadsheet, library and utility developments as overviewed below.

### Solvers

SBB has new options changing node selection procedures and accepting solutions that are not reported as optimal by NLP codes. They are briefly discussed at the beginning of the amended SBB manual (<http://www.gams.com/docs/solver/sbb.pdf>).

The GAMS/XA link has been modified to work with the newest version (Version 13) of XA. New features are included (including a Newton-barrier approach) but I do not find discussion of them in the GAMS/XA reference manual or on the Sunset Software web page (<http://www.sunsetsoft.com/>).

MOSEK from EKA Consulting is available in Beta version and can solve LP, MIP, quadratic and convex NLP problems. Information on MOSEK is available on the web site <http://www.mosek.com/> with a solver reference guide at <http://www.mosek.com/download/doc/pdf/2/mosekman.pdf>.

OQMS from Optimal Methods, Inc is available as a BETA solver and performs global optimization of smooth constrained problems with either all continuous variables or a mixture of discrete and continuous variables. This solver combines mathematical programming approaches with heuristics like scatter search. No document is available but an older version OQGRG is the topic of a sentence on <http://www.gamsworld.org/global/index.htm> under solvers. Related software is discussed on the Optimal Methods home page at <http://www.optimalmethods.com/>.

NLPEC a solver for MPEC models is available in beta form. The only description I can find is in the release notes (<http://www.gams.com/docs/release/release.htm#20.6>) which I will not simply restate here. For more information one could try the MPEC mailing list or MPEC world sponsors through <http://www.gamsworld.org/mpec/index.htm>.

PATHNLP and BARON have some updated features.

### Library Additions

Four files have been added to the library. TVCSCHED - a mixed integer television commercial scheduling application. QP1X - an example of GDX file data load and

unloads. CLEARLAK and SRKANDW illustrate the use of a scenario reduction feature for stochastic programs.

## Utilities

Several utilities have been added to the GAMS distribution.

MPS2GMS converts MPS files into a GAMS program making use of the GAMS GDX facility. This replaces the contributed utility mps2gams.

SCENRED is a scenario reduction algorithm for stochastic programs which determines a subset of scenarios and the associated probabilities. ScenRed was developed by Prof. Dr. W. Rmisch (<http://www.mathematik.hu-berlin.de/~romisch/>) and associates and is discussed on <http://www-iam.mathematik.hu-berlin.de/~romisch/projects/gams/scenred.html>.

Functionally ScenRed takes the original tree from the modeler, along with parameters controlling the reduction, and returns a reduced tree for use in subsequent solves or data manipulation. A writeup is now available on the new distribution of GAMS (solver documentation) and on the GAMS web page at <http://www.gams.com/docs/solver/scenred.pdf>. Examples are present in the library files CLEARLAK and SRKANDW.

POSIX Utilities - The GAMS system for Windows now includes executable versions of a number of utilities available on Unix systems. These include batch string editors, copy commands, file deletion, and file concatenation routines, among many others. Use of these commands in conjunction with the \$CALL and EXECUTE commands in GAMS allows one to write file manipulation sequences within GAMS code that function without change on both Windows and UNIX/LINUX machines. Information on the exact commands allowed, links to syntax descriptions, and GAMS based examples can be found on <http://www.gams.com/contrib/gbin/gbin.htm>.

## Spreadsheets

The GAMS to and from spreadsheet utilities XLDUMP, XLEXPOR and XLIMPORT developed by Tom Rutherford's group at the University of Colorado have been updated in a project jointly carried out between Rutherford and GAMS. Beta versions are now included in the standard GAMS release. They pass data back and forth and now can also import set elements from the spreadsheet. These are GMS files resident in the INCLIB subdirectory of the GAMS directory and are addressed using LIBINCLUDE as discussed in the documentation on <http://debreu.colorado.edu/xllink/xllink.htm>.

## GDX

Above in several places and all over the release notes, the GAMSWORLD. Performance page and the spreadsheet utilities there is mention of GDX files. Given this I decided a

few words were in order about what these things are and how a user might exploit them. The notes on <http://www.gams.com/mccarl/gdxuseage.htm> or <http://www.gams.com/mccarl/gdxusage.pdf> give an explanation of these items.

## **CHECKVER**

GAMS has just implemented an automatic email based service with which you can discover what updates are available to GAMS above and beyond those in your current system . It will also tell you whether your license file is recent enough to allow these updates. You invoke the system as described on <http://www.gams.com/sales/checkver.htm>.

## **Data Envelopment Analysis and Slice Model Solver**

Some time ago unbeknownst to me a data envelopment solver feature was placed on the GAMS web page and has become a solver choice. The feature is described on the GAMS web page at <http://www.gams.com/contrib/gamsdea/dea.htm>.

## **Courses offered**

I teach Advanced GAMS in College Station, Texas on November 18-21, 2002 and Basic GAMS in May 19-22, 2003. Further information and other courses are listed on <http://www.gams.com/courses.htm>.

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