# Bruce McCarl's GAMS Newsletter Number 33

This newsletter covers

- A new expanded user guide documentation version
- Developments in the GAMS 24.1 release
  - Language changes
  - Solvers
  - Utility for CSV to GDX
  - Window Messaging
- File Comparisons
- API Interfaces with other programs
- Alternative EXCEL GAMS Job spawning
- Future courses I will teach

## Expanded GAMS User Guide by McCarl et al.

I updated the Expanded User's Guide to reflect 24.1 with changes added here and there. The latest can be found at
http://www.gams.com/dd/docs/bigdocs/gams2002/mccarlgamsuserguide.pdf and will be in upcoming GAMS releases.

## New GAMS Features in Release 24.1

- A new log output option lo=4 has been added: it writes the contents of the LOG window simultaneously to log file and to standard output.
- New option NoNewVarEqu will trigger a compilation error when new equation or variable symbols are introduced. This is useful for testing GAMS run-time environments.
- New option SymPrefix that prefixes all user symbols compiled in this run with the string value of this option before saving to a save/restart file. This is useful when merging multiple models together to avoid name clashes.

## New items in GAMS IDE

The text comparison utility menu has been changed and now has a structure similar to the GDXDIFF menu; previous file selections are available in the drop-down fields

The help menu has a link to the search page on the GAMS website

## Converting CSV to GDX

A new utility is included in the release that converts a CSV file to a GDX file. It is called CSV2GDX. Documentation is accessible though the IDE under help and docs and tools in the gdxutils.chm and gdxutils.pdf files. A simple example of its use is in the GAMS data library file called csv2gdx1(85).

### Sending Windows a message

A new tool MessageReceiverWindow is included that receives messages from GAMS. The GAMS Test Library model mrw01 demonstrates its usage.

## File Comparison

The IDE now has an integrated Text differencing feature that will compare two files in text or gms format and report on any found differences.

This is done through the GAMSIDE file menu using Utilities menu and the feature Diff Textfiles. In turn one gets a window where one must specify the names of the two files to be compared using the input file 1 and input file 2 boxes 1 and open 2 to choose the two files to compare. Once that is done, selecting the OK button causes the files to be compared line by line.

The result for example files

filetocompare1.gms

```
set aa /a1,a2,a3/;
set b /b1,be/

parameter yy(aa)
   /a1  2
    a3  4/
```
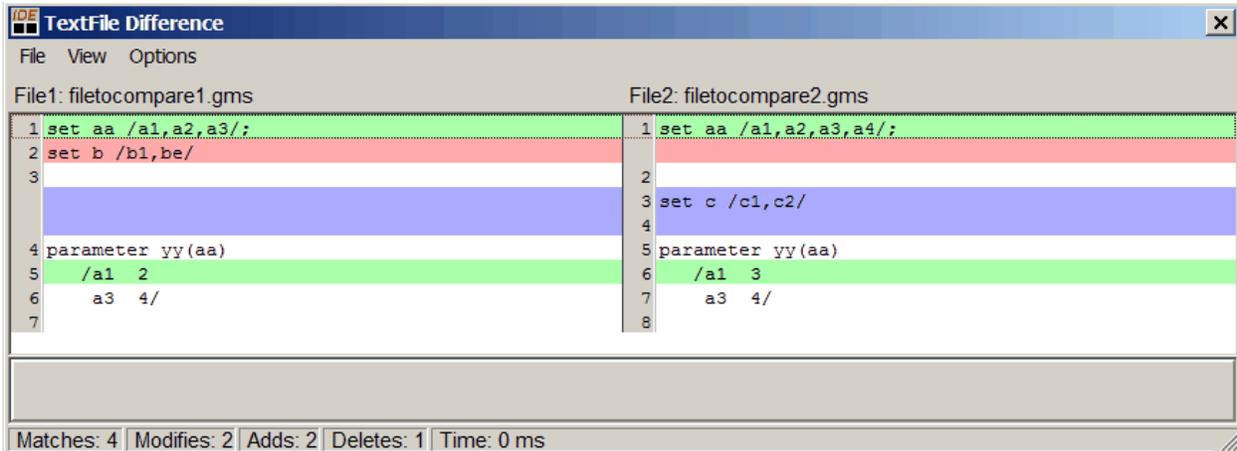
and

filetocompare2.gms

```
set aa /a1,a2,a3,a4/;

set c /c1,c2/

parameter yy(aa)
   /a1  3
    a3  4/
```

is given in the following window.

When lines are identical in both files they come out with a white background. Green lines identify those with differences in the line content. Reddish lines identify new lines in left hand file while blue identifies new content in the right hand file.

One can also do this using the posix utility Diff as follows

```
* filecompare.gms

*get location of GAMS system directory
$setglobal root "%gams.sdir%"
*figure location or Expanded GAMS user guide files
$setglobal mccarlguide "%root%docs\bigdocs\gams2002\"
*identify name of first file to compare
$setglobal f1 %mccarlguide%filetocompare1.gms
*identify name of second file to compare
$setglobal f2 %mccarlguide%filetocompare2.gms
*show the control variables so you can check names are right
$show
*invoke the difference  note the root and gbin parts tell where the
diff file is
$call '"%root%gbin\diff.exe"  %f1% %f2%'
```

## Solvers

- New libraries are included for ALPHAECP, Baron, Bonmin, CBC, Couenne, Cplex/CplexD, CONOPT, DICOPT, EMPSP, GloMIQO, Gurobi, Ipopt, IpoptH, JAMS, KNITRO, Lindo, LindoGlobal, MOSEK, MSNLP, OQNLP, Osi, SCIP, SULUM and XPRESS
- MIP capability was added to the solver SULUM as documented in the commercial solver part of the Solver manual.
- A new solver ANTIGONE is introduced for global optimization of deterministic nonconvex MINLP problems on Windows and Linux. Its use requires the presence of a GAMS/CPLEX license and either a GAMS/CONOPT or a GAMS/SNOPT license. It is documented in the commercial part of the solver manual.

- A parallelized mixed integer optimizer was added to MOSEK
- OSL and OSLSE were dropped
- Solvers with a significant set of new features include ANTIGONE, CBC, EMPSP, Gurobi, Lindo, LindoGlobal, MOSEK and SULUM.

## API Interfaces with External programs

New features were added to the object oriented GAMS APIs including e.g. the capability to specify the domains of symbols, check for domain violations, copying ModelInstances, or setting the debug level using an environment variable. Tutorials are also included and can be accessed through the IDE help function under docs and API. More details can also be found in the release notes.

## Alternative EXCEL GAMS Job spawning

An example called SpawnGAMSExcel(84)  is in the new release in the GAMS Data library that shows 3 different ways to specify the GAMS System Directory via VBA:

- By using the windows registry
- By using the "gamside.ini" file that is created when the GAMSIDE is opened
- Manually

Notes

- The GAMS model can contain several solve statements.
- The solution is obtained via the VBA code activation of  "trace" command line parameter
- The VBA modules can be exported and used in other programs
- If the Excel Workbook is shared, then GDXXRW can be used to write the solution into the same Workbook

## Courses offered

I will be teaching

- Basic to Advanced GAMS class July 29, 2013- Aug 2, 2013 (5 days) in the Colorado mountains at Frisco (near Breckenridge). The course  spans from Basic topics to an Advanced GAMS class.  Details are found at http://www.gams.com/courses/basic_and_advanced.pdf  .
- Basic GAMS class July 29, 2013- July 31, 2013 (3 days) in the Colorado mountains at Frisco (near Breckenridge). The course starts assuming no GAMS background.  Details are given at http://www.gams.com/courses/basic.pdf .
- Advanced GAMS class July 31, 2013- Aug 2, 2013 (3 days) in the Colorado mountains at Frisco (near Breckenridge). The course is for users, who have a GAMS background. Details are found  at http://www.gams.com/courses/advanced.pdf  .

Further information and other courses are listed on http://www.gams.com/courses.htm .

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