See next page for some inserted comments by Dr. E. Triantaphyllou

NEOS Results for Job #12737332

From: support@neos-server.org

To: etriantaphyllou@yahoo.com

Date: Wednesday, February 8, 2023 at 12:15 PM CST

Executed on prod-exec-7.neos-server.org
GAMS 41.4.0 caab8bc0 Dec 14, 2022   LEX-LEG x86 64bit/Linux - 02/08/23 12:14:50 Page 1
G e n e r a l A l g e b r a i c M o d e l i n g S y s t e m
C o m p i l a t i o n

COMPILATION TIME   =   0.001 SECONDS   2 MB 41.4.0 caab8bc0 LEX-LEG
GAMS 41.4.0 caab8bc0 Dec 14, 2022   LEX-LEG x86 64bit/Linux - 02/08/23 12:14:50 Page 2
G e n e r a l A l g e b r a i c M o d e l i n g S y s t e m
Range Statistics   SOLVE First_Illustrative_Example_Section_3_1 Using NLP From line 278

RANGE STATISTICS (ABSOLUTE NON-ZERO FINITE VALUES)

RHS   [min, max] : [1.200E-01, 1.000E+00] - Zero values observed as well
Bound   [min, max] : [NA,   NA] - Zero values observed as well
Matrix   [min, max] : [1.000E+00, 2.000E+00] - Zero values observed as well

GAMS 41.4.0 caab8bc0 Dec 14, 2022   LEX-LEG x86 64bit/Linux - 02/08/23 12:14:50 Page 3
G e n e r a l A l g e b r a i c M o d e l i n g S y s t e m
Model Statistics   SOLVE First_Illustrative_Example_Section_3_1 Using NLP From line 278

MODEL STATISTICS

BLOCKS OF EQUATIONS   51   SINGLE EQUATIONS   51
BLOCKS OF VARIABLES   60   SINGLE VARIABLES   60
NON ZERO ELEMENTS   198   NON LINEAR N-Z   96
CODE LENGTH   318   CONSTANT POOL   16

GENERATION TIME   =   0.002 SECONDS   3 MB 41.4.0 caab8bc0 LEX-LEG
GAMS 41.4.0 caab8bc0 Dec 14, 2022   LEX-LEG x86 64bit/Linux - 02/08/23 12:14:50 Page 4

G e n e r a l A l g e b r a i c M o d e l i n g S y s t e m
Solution Report   SOLVE First_Illustrative_Example_Section_3_1 Using NLP From line 278

            S O L V E   S U M M A R Y

  MODEL First_Illustrative_Example_Section_3_1 OBJECTIVE Z
  TYPE   NLP   DIRECTION MINIMIZE
  SOLVER BARON   FROM LINE 278

**** SOLVER STATUS   1 Normal Completion
**** MODEL STATUS   2 Locally Optimal
**** OBJECTIVE VALUE   6.6117

RESOURCE USAGE, LIMIT   54.790 10000000000.000
ITERATION COUNT, LIMIT   0   2147483647
EVALUATION ERRORS   0   0

GAMS/BARON   41.4.0 caab8bc0 Dec 14, 2022   LEG x86 64bit/Linux

BARON is a product of The Optimization Firm, LLC. http://www.minlp.com/
Parts of the BARON software were created at the
University of Illinois at Urbana-Champaign.

===
BARON version 22.9.30. Built: LNX-64 Fri Sep 30 09:06:37 EDT 2022

BARON is a product of The Optimization Firm.
For information on BARON, see https://minlp.com/about-baron

If you use this software, please cite publications from
https://minlp.com/baron-publications, such as:

Khajavirad, A. and N. V. Sahinidis,
A hybrid LP/NLP paradigm for global optimization relaxations,
Mathematical Programming Computation, 10, 383-421, 2018.
===
This BARON run may utilize the following subsolver(s)
For LP/MIP/QP: CLP/CBC, ILOG CPLEX
For NLP: MINOS, SNOPT, External NLP, IPOPT, FILTERSQP

Solution   = 6.61169637563586 found at node 21
Best possible = 6.61103521558
Absolute gap = 0.000661160055856591 optca = 1E-9
Relative gap = 9.99985507944633E-5 optcr = 0.0001

```
                    LOWER   LEVEL   UPPER   MARGINAL

---- EQU Equation2    0.120   0.120   0.120   106.892
---- EQU Constrain~      .   -9.06E-11   +INF     3.450
---- EQU Constrain~      .   -5.49E-11   +INF     6.636
---- EQU Constrain~      .   -1.50E-10   +INF     5.486
---- EQU Constrain~      .   -7.58E-11   +INF     3.450
---- EQU Constrain~      .   -1.21E-10   +INF     6.636
---- EQU Constrain~      .   -8.81E-11   +INF     5.486
---- EQU Constrain~      .   -9.74E-11   +INF     3.450
---- EQU Constrain~      .   -1.02E-10   +INF     6.636
---- EQU Constrain~      .   -1.95E-11   +INF     5.486
---- EQU Constrain~      .   -5.74E-11   +INF     6.234
---- EQU Constrain~      .   -1.54E-10   +INF     8.132
---- EQU Constrain~      .   -9.89E-11   +INF     5.694
---- EQU Constrain~      .   -1.40E-10   +INF     6.234
---- EQU Constrain~      .   -8.55E-11   +INF     8.132
---- EQU Constrain~      .   -1.13E-10   +INF     5.694
---- EQU Constrain~      .   -9.43E-11   +INF     6.234
---- EQU Constrain~      .   -5.22E-11   +INF     8.132
---- EQU Constrain~      .   -1.51E-10   +INF     5.694
---- EQU Equation1    1.000   1.000   1.000   -12.827
---- EQU EQ_t1_1         .   -1.83E-11     .     1.000
---- EQU EQ_t1_2         .   -5.98E-12     .     1.000
---- EQU EQ_t1_3         .   -3.08E-10     .     1.000
---- EQU EQ_t1_4         .   -6.83E-11     .     1.000
---- EQU EQ_t2_1         .   -5.49E-11     .     1.000
---- EQU EQ_t2_2         .   -9.56E-11     .     1.000
---- EQU EQ_t2_3         .   -9.20E-11     .     1.000
---- EQU EQ_t2_4         .   -5.23E-11     .     1.000
---- EQU EQ_t3_1         .   -1.76E-10     .     1.000
---- EQU EQ_t3_2         .   -5.65E-11     .     1.000
---- EQU EQ_t3_3         .   -6.10E-10     .     1.000
---- EQU EQ_t3_4         .   -2.94E-10     .     1.000
---- EQU EQ_t4_1         .   -3.16E-11     .     1.000
---- EQU EQ_t4_2         .   -4.96E-11     .     1.000
---- EQU EQ_t4_3         .   -3.73E-10     .     1.000
---- EQU EQ_t4_4         .   -3.18E-11     .     1.000
---- EQU EQ_t5_1         .   -4.78E-12     .     1.000
---- EQU EQ_t5_2         .   -9.83E-11     .     1.000
---- EQU EQ_t5_3         .   -2.68E-10     .     1.000
---- EQU EQ_t5_4         .   -2.46E-11     .     1.000
---- EQU EQ_t6_1         .   -6.60E-11     .     1.000
---- EQU EQ_t6_2         .   -2.83E-13     .     1.000
```

```
---- EQU EQ_t6_3        .   -3.08E-10    .      1.000
---- EQU EQ_t6_4        .   -4.38E-11    .      1.000
---- EQU EQ_tt1         .      .         .    -1.73E-10
---- EQU EQ_tt2         .      .         .    -1.73E-10
---- EQU EQ_tt3         .      .         .    -1.73E-10
---- EQU EQ_tt4         .      .         .    -3.28E-12
---- EQU EQ_tt5         .      .         .    -3.28E-12
---- EQU EQ_tt6         .      .         .    -3.28E-12
---- EQU Objective~     .      .         .      1.000
```

```
                    LOWER    LEVEL    UPPER    MARGINAL

---- VAR Z            -INF     6.612    +INF       .
---- VAR a1            .       0.294    +INF   -2.64E-11
---- VAR a2            .       0.235    +INF    1.998E-11
---- VAR a3            .       0.235    +INF    1.998E-11
---- VAR a4            .       0.235    +INF    1.998E-11
---- VAR X1_1          .       1.507    +INF    2.512E-11
---- VAR X1_2          .       1.375    +INF   -1.54E-10
---- VAR X1_3          .       0.865    +INF   -6.42E-11
---- VAR X1_4          .       0.355    +INF   -1.59E-10
---- VAR X2_1          .       1.507    +INF    2.512E-11
---- VAR X2_2          .       0.355    +INF   -1.59E-10
---- VAR X2_3          .       1.375    +INF   -1.54E-10
---- VAR X2_4          .       0.865    +INF   -6.42E-11
---- VAR X3_1          .       1.507    +INF    2.512E-11
---- VAR X3_2          .       0.865    +INF   -6.42E-11
---- VAR X3_3          .       0.355    +INF   -1.59E-10
---- VAR X3_4          .       1.375    +INF   -1.54E-10
---- VAR X4_1          .       0.163    +INF    4.492E-11
---- VAR X4_2          .       1.733    +INF    5.493E-11
---- VAR X4_3          .       1.223    +INF    4.323E-11
---- VAR X4_4          .       0.713    +INF    4.408E-11
---- VAR X5_1          .       0.163    +INF    4.492E-11
---- VAR X5_2          .       0.713    +INF    4.407E-11
---- VAR X5_3          .       1.733    +INF    5.493E-11
---- VAR X5_4          .       1.223    +INF    4.323E-11
---- VAR X6_1          .       0.163    +INF    4.492E-11
---- VAR X6_2          .       1.223    +INF    4.323E-11
---- VAR X6_3          .       0.713    +INF    4.408E-11
---- VAR X6_4          .       1.733    +INF    5.493E-11
---- VAR t1_1          .       0.258    +INF    2.754E-11
---- VAR t1_2          .       0.140    +INF   -1.21E-10
---- VAR t1_3          .       0.018    +INF    1.2624E-9
---- VAR t1_4          .       0.416    +INF    2.214E-10
---- VAR t2_1          .       0.258    +INF    2.754E-11
```

```
---- VAR t2_2          .      0.416    +INF   2.214E-10
---- VAR t2_3          .      0.140    +INF   -1.21E-10
---- VAR t2_4          .      0.018    +INF   1.2624E-9
---- VAR t3_1          .      0.258    +INF   2.754E-11
---- VAR t3_2          .      0.018    +INF   1.2624E-9
---- VAR t3_3          .      0.416    +INF   2.214E-10
---- VAR t3_4          .      0.140    +INF   -1.21E-10
---- VAR t4_1          .      0.701    +INF   -7.50E-11
---- VAR t4_2          .      0.538    +INF   8.279E-11
---- VAR t4_3          .      0.050    +INF   1.572E-10
---- VAR t4_4          .      0.082    +INF   -1.17E-11
---- VAR t5_1          .      0.701    +INF   -7.50E-11
---- VAR t5_2          .      0.082    +INF   -1.17E-11
---- VAR t5_3          .      0.538    +INF   8.279E-11
---- VAR t5_4          .      0.050    +INF   1.572E-10
---- VAR t6_1          .      0.701    +INF   -7.50E-11
---- VAR t6_2          .      0.050    +INF   1.572E-10
---- VAR t6_3          .      0.082    +INF   -1.17E-11
---- VAR t6_4          .      0.538    +INF   8.279E-11
---- VAR ee         -INF      0.120    +INF      .
---- VAR tt1          .      0.833    +INF   1.725E-10
---- VAR tt2          .      0.833    +INF   1.725E-10
---- VAR tt3          .      0.833    +INF   1.725E-10
---- VAR tt4          .      1.371    +INF   3.284E-12
---- VAR tt5          .      1.371    +INF   3.284E-12
---- VAR tt6          .      1.371    +INF   3.284E-12


**** REPORT SUMMARY :      0    NONOPT
                     0 INFEASIBLE
                     0  UNBOUNDED
                     0   ERRORS


EXECUTION TIME    =    54.815 SECONDS    3 MB  41.4.0 caab8bc0 LEX-LEG
```

USER: NEOS Server License prod-exec-7.neos-server.orgS221207/0001AB-GEN
  mac@2c:ea:7f:71:ac:18   DCE1890
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**** FILE SUMMARY

Input   /var/lib/condor/execute/dir_226554/gamsexec/MODEL.gms
Output   /var/lib/condor/execute/dir_226554/gamsexec/solve.lst