NEOS RESULTS
SERVER

```
************************************************************

      NEOS Server Version 6.0
      Job#    : 12737520
      Password : vDRfLQma
      User    :
      Solver  : go:BARON:GAMS
      Start   : 2023-02-08 13:13:44
      End     : 2023-02-08 13:14:02
      Host    : prod-sub-1.neos-server.org

      Disclaimer:

      This information is provided without any express or
      implied warranty. In particular, there is no warranty
      of any kind concerning the fitness of this
      information for any particular purpose.

      Announcements:
************************************************************
Executed on prod-exec-6.neos-server.org
GAMS 41.4.0  caab8bc0 Dec 14, 2022          LEX-LEG x86 64bit/Linux - 02/08/23 13:13:46 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 13:13:46 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 REAL_EXAMPLE_Original_Model_M1 Using NLP From line 293


RANGE STATISTICS (ABSOLUTE NON-ZERO FINITE VALUES)

RHS      [min, max] : [ 2.000E-02, 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 13:13:46 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 REAL_EXAMPLE_Original_Model_M1 Using NLP From line 293
```

This is the output file generated by the NEOS / BARON system when the program in the file <Example_with_Real_Data_Original_Model_M1.txt> was run.

This comment was written by Dr. E. Triantaphyllou.
Date: February 8, 2023.

```
MODEL STATISTICS

BLOCKS OF EQUATIONS          58      SINGLE EQUATIONS          58
BLOCKS OF VARIABLES          68      SINGLE VARIABLES          68
NON ZERO ELEMENTS           215      NON LINEAR N-Z           126
CODE LENGTH                 409      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 13:13:46 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 REAL_EXAMPLE_Original_Model_M1 Using NLP From line 293


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

    MODEL   REAL_EXAMPLE_Original_Model_M1   OBJECTIVE  Z
    TYPE    NLP                              DIRECTION  MINIMIZE
    SOLVER  BARON                            FROM LINE  293

**** SOLVER STATUS     1 Normal Completion
**** MODEL STATUS      2 Locally Optimal
**** OBJECTIVE VALUE             0.2004

 RESOURCE USAGE, LIMIT        16.540 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      = 0.200422997989164  found at node 635
 Best possible = 0.200404831756
 Absolute gap  = 1.81662331636689E-5  optca = 1E-9
 Relative gap  = 9.06394642627347E-5  optcr = 0.0001



                      LOWER       LEVEL      UPPER      MARGINAL

---- EQU Equation1    1.000       1.000      1.000       -0.400
---- EQU Equation2    0.020       0.020      0.020       20.002
---- EQU e01_1           .       -3.865E-7      .         1.000
---- EQU e01_2           .       -3.921E-7      .         1.000
---- EQU e01_3           .       -1.030E-7      .         1.000
---- EQU e01_4           .       -1.79E-10      .         1.000
---- EQU e01_5           .       -1.675E-7      .         1.000
---- EQU e02_1           .           .          .         1.000
---- EQU e02_2           .       -2.471E-8      .         1.000
---- EQU e02_3           .       -1.945E-7      .         1.000
---- EQU e02_4           .       -3.559E-7      .         1.000
---- EQU e02_5           .       -1.960E-9      .         1.000
---- EQU e03_1           .       -6.379E-7      .       -3.677E+7
---- EQU e03_2           .       -7.744E-7      .         1.000
---- EQU e03_3           .       -3.148E-7      .         1.000
---- EQU e03_4           .       -6.038E-8      .         1.000
---- EQU e03_5           .       -2.508E-8      .         1.000
---- EQU e04_1           .       -2.138E-6      .         1.000
---- EQU e04_2           .       -1.079E-7      .         1.000
---- EQU e04_3           .       -5.069E-7      .         1.000
---- EQU e04_4           .       -5.646E-7      .         1.000
---- EQU e04_5           .       -1.705E-6      .         1.000
---- EQU e05_1           .       -2.825E-7      .         1.000
---- EQU e05_2           .       -4.988E-8      .         1.000
---- EQU e05_3           .       -8.227E-9      .         1.000
---- EQU e05_4           .       -3.012E-9      .         1.000
---- EQU e05_5           .       -4.306E-9      .         1.000
---- EQU e06_1           .       -3.322E-7      .         1.000
---- EQU e06_2           .       -3.083E-7      .         1.000
---- EQU e06_3           .       -1.439E-6      .         1.000
---- EQU e06_4           .           .          .         1.000
---- EQU e06_5           .       -3.173E-7      .         1.000
---- EQU Equation3       .           .          .         1.000
---- EQU Objective~      .           .          .         1.000
---- EQU eq1_1           .       -2.561E-6     +INF       1.680
---- EQU eq1_2           .       4.5488E-6     +INF       1.273
```

```
---- EQU eq1_3         .     -8.641E-6     +INF      2.930
---- EQU eq1_4         .     -9.240E-6     +INF      2.474
---- EQU eq2_1         .     -6.979E-6     +INF      1.209
---- EQU eq2_2         .      2.2709E-7    +INF      0.940
---- EQU eq2_3         .     -3.144E-6     +INF      1.867
---- EQU eq2_4         .      2.7562E-6    +INF      0.796
---- EQU eq3_1         .     -2.423E-6     +INF      0.168
---- EQU eq3_2         .     -3.855E-6      .        0.411
---- EQU eq3_3         .      4.0710E-6    +INF      0.164
---- EQU eq3_4         .     -2.166E-6     +INF      0.327
---- EQU eq4_1         .      8.1376E-6     .       -0.297
---- EQU eq4_2         .      0.015        +INF       .
---- EQU eq4_3         .      4.8710E-7     .        0.011
---- EQU eq4_4         .     -7.386E-6      .        0.858
---- EQU eq5_1         .      5.0566E-6    +INF      0.550
---- EQU eq5_2         .     -8.727E-6     +INF      0.930
---- EQU eq5_3         .     -1.798E-6     +INF      0.892
---- EQU eq5_4         .     -1.353E-6     +INF      0.716
---- EQU eq6_1         .      3.6265E-6    +INF      0.550
---- EQU eq6_2         .     -4.007E-6     +INF      0.930
---- EQU eq6_3         .     -4.778E-6     +INF      0.892
---- EQU eq6_4         .      4.4761E-6    +INF      0.716

                     LOWER     LEVEL     UPPER    MARGINAL

---- VAR Z           -INF      0.200     +INF        .
---- VAR a1           .        0.227     +INF        .
---- VAR a2           .        0.185     +INF        .
---- VAR a3           .        0.172     +INF        .
---- VAR a4           .        0.203     +INF        .
---- VAR a5           .        0.213     +INF        .
---- VAR ee          -INF      0.020     +INF        .
---- VAR X1_1         .        0.956     +INF        .
---- VAR X1_2         .        0.957     +INF        .
---- VAR X1_3         .        1.143     +INF        .
---- VAR X1_4         .        1.170     +INF        .
---- VAR X1_5         .        0.735     +INF        .
---- VAR X2_1         .        0.972     +INF        .
---- VAR X2_2         .        1.084     +INF        .
---- VAR X2_3         .        0.932     +INF        .
---- VAR X2_4         .        0.891     +INF        .
---- VAR X2_5         .        1.127     +INF        .
---- VAR X3_1         .        1.005     +INF        .
---- VAR X3_2         .        1.018     +INF     4.5768E-9
---- VAR X3_3         .        0.976     +INF        .
---- VAR X3_4         .        1.028     +INF    -1.952E-8
---- VAR X3_5         .        0.975     +INF     2.9242E-8
---- VAR X4_1         .        0.968     +INF        .
---- VAR X4_2         .        1.001     +INF    -2.322E-8
```

```
---- VAR X4_3          .       1.074      +INF       .
---- VAR X4_4          .       0.914      +INF       .
---- VAR X4_5          .       1.030      +INF       .
---- VAR X5_1          .       1.065      +INF       .
---- VAR X5_2          .       0.983      +INF       .
---- VAR X5_3          .       0.939      +INF       .
---- VAR X5_4          .       0.996      +INF   -4.383E-8
---- VAR X5_5          .       1.039      +INF       .
---- VAR X6_1          .       1.064      +INF       .
---- VAR X6_2          .       0.982      +INF   7.4102E-9
---- VAR X6_3          .       0.938      +INF       .
---- VAR X6_4          .       0.995      +INF       .
---- VAR X6_5          .       1.038      +INF       .
---- VAR t1_1          .       0.002      +INF   -7.379E-8
---- VAR t1_2          .       0.002      +INF       .
---- VAR t1_3          .       0.020      +INF       .
---- VAR t1_4          .       0.029      +INF       .
---- VAR t1_5          .       0.070      +INF       .
---- VAR t2_1          .       0.001      +INF       .
---- VAR t2_2          .       0.007      +INF   3.2891E-8
---- VAR t2_3          .       0.005      +INF       .
---- VAR t2_4          .       0.012      +INF       .
---- VAR t2_5          .       0.016      +INF       .
---- VAR t3_1          .     2.8379E-5    +INF   3.6768E+7
---- VAR t3_2          .     3.1004E-4    +INF       .
---- VAR t3_3          .       0.001      +INF       .
---- VAR t3_4          .       0.001      +INF       .
---- VAR t3_5          .       0.001      +INF       .
---- VAR t4_1          .       0.001      +INF       .
---- VAR t4_2          .     3.8670E-7    +INF       .
---- VAR t4_3          .       0.005      +INF   2.7691E-8
---- VAR t4_4          .       0.007      +INF       .
---- VAR t4_5          .       0.001      +INF   3.4203E-8
---- VAR t5_1          .       0.004      +INF       .
---- VAR t5_2          .     2.9967E-4    +INF       .
---- VAR t5_3          .       0.004      +INF       .
---- VAR t5_4          .     1.6350E-5    +INF       .
---- VAR t5_5          .       0.002      +INF       .
---- VAR t6_1          .       0.004      +INF       .
---- VAR t6_2          .     3.3097E-4    +INF       .
---- VAR t6_3          .       0.004      +INF       .
---- VAR t6_4          .     2.3718E-5    +INF       .
---- VAR t6_5          .       0.001      +INF       .
---- VAR tt            .       0.200      +INF       .


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

```
                              0      ERRORS


   EXECUTION TIME        =        16.573 SECONDS       3 MB  41.4.0 caab8bc0 LEX-LEG


   USER: NEOS Server License prod-exec-6.neos-server.orgS221207/0001AB-GEN
         mac@d0:94:66:89:89:0f                                    DCE1890
         License for teaching and research at degree granting institutions


   **** FILE SUMMARY

   Input      /var/lib/condor/execute/dir_49250/gamsexec/MODEL.gms
   Output     /var/lib/condor/execute/dir_49250/gamsexec/solve.lst
```
Additional Output:

12737520-vDRfLQma-solver-output.zip