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    OPTIMIZATION OF TEST PROBLEM: "GRAIN_SILO_V1.FOR"


PROBLEM DEVELOPED BY S. N. GHANI:


INPUT PARAMETERS FOR OPTIMISATION SUBROUTINE EVOP
    REFLECTION COEFFICIENT                                                  ALPHA =       0.13000000E+01
    CONTRACTION COEFFICIENT                                                  BETA =       0.50000000E+00
    EXPANSION COEFFICIENT                                                   GAMA =       0.20000000E+01
    EXPLICIT CONSTRAINT RETENTION COEFFICIENT                                 DEL =       0.10000000E-11
    ACCURACY PARAMETER FOR CONVERGENCE                                        PHI =       0.10000000E-09
    PARAMETER FOR DETERMINING COLLAPSE OF A COMPLEX IN A SUBSPACE          PHICPX =       0.10000000E-10
    GLOBAL LIMIT ON THE NUMBER OF CALLS TO FUNCTION SUBROUTINE              LIMIT =    6000
    NUMBER OF COMPLEX RESTARTS                                             NRSTRT =      10
    NUMBER OF CALLS TO FUNCTION SUBROUTINE AFTER WHICH CONVERGENCE TESTS ARE MADE  KNT =       25
    NUMBER OF CONSECUTIVE CONVERGENCE TEST_1                                ICON =       5
    NUMBER OF VARIABLES = NUMBER OF EXPLICIT CONSTRAINTS                       N =       2
    NUMBER OF IMPLICIT CONSTRAINTS                                           NIC =       1
    NUMBER OF COMPLEX VERTICES                                                 K =       4
    UPPER BOUND OF EXPLICIT CONSTRAINTS AT THE STARTING POINT             XMAX( 1) =       0.10000000E+03
                                                                          XMAX( 2) =       0.10000000E+03
    LOWER BOUND OF EXPLICIT CONSTRAINTS AT THE STARTING POINT             XMIN( 1) =       0.00000000E+00
                                                                          XMIN( 2) =       0.00000000E+00
    COORDINATES OF THE STARTING POINT                                       XT( 1) =       0.99000000E+02
                                                                            XT( 2) =       0.99000000E+02
    UPPER BOUND OF IMPLICIT CONSTRAINTS AT THE STARTING POINT            XXMAX( 1) =       0.10000000E+07
    LOWER BOUND OF IMPLICIT CONSTRAINTS AT THE STARTING POINT            XXMIN( 1) =       0.25465500E+03
    IMPLICIT CONSTRAINTS AT THE STARTING POINT                              XX( 1) =       0.97029900E+06
    FUNCTION VALUE AT THE STARTING POINT                                    FF( 1) =       0.48390518E+07



    INITIAL COMPLEX CONFIGURATION


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.48390518E+07
                                                        XT( 1) =   0.99000000E+02
                                                        XT( 2) =   0.99000000E+02

                2                 0.81186404E+06
                                                        XT( 1) =   0.39020014E+02
                                                        XT( 2) =   0.32590434E+02

                3                 0.12595449E+07
                                                        XT( 1) =   0.44362485E+02
                                                        XT( 2) =   0.72861010E+02

                4                 0.10012551E+07
                                                        XT( 1) =   0.37903717E+02
                                                        XT( 2) =   0.71673185E+02



OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                                NFUNC =       58
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      188
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      181
    COORDINATES OF THE MINIMUM                                                          XT( 1) =       0.48460369E+01
                                                                                        XT( 2) =       0.10843732E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                                  F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                           XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                               XMAX( 1) =       0.10000000E+03
                                                                                      XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                               XMIN( 1) =       0.00000000E+00
                                                                                      XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                              XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                              XXMIN( 1) =       0.25465500E+03



FINAL COMPLEX CONFIGURATION.


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259185E+05
                                                        XT( 1) =   0.48460800E+01
                                                        XT( 2) =   0.10843539E+02

                2                 0.52259184E+05
                                                        XT( 1) =   0.48460369E+01
                                                        XT( 2) =   0.10843732E+02

                3                 0.52259185E+05
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                                                    XT( 1) =   0.48459985E+01
                                                    XT( 2) =   0.10843904E+02

              4                 0.52259185E+05
                                                    XT( 1) =   0.48460256E+01
                                                    XT( 2) =   0.10843783E+02
```

********** RESTARTING "EVOP" TO CHECK THE MINIMUM

```
    INITIAL COMPLEX CONFIGURATION

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

              1                 0.52259184E+05
                                                    XT( 1) =   0.48460369E+01
                                                    XT( 2) =   0.10843732E+02

              2                 0.39318467E+07
                                                    XT( 1) =   0.88905662E+02
                                                    XT( 2) =   0.88375318E+02

              3                 0.80018290E+06
                                                    XT( 1) =   0.30100936E+02
                                                    XT( 2) =   0.85227734E+02

              4                 0.11215120E+07
                                                    XT( 1) =   0.40457982E+02
                                                    XT( 2) =   0.75698286E+02
```

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OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                                NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      128
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      123
    COORDINATES OF THE MINIMUM                                                      XT( 1) =       0.48460369E+01
                                                                                    XT( 2) =       0.10843732E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                              F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                       XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                            XMAX( 1) =       0.10000000E+03
                                                                                   XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                            XMIN( 1) =       0.00000000E+00
                                                                                   XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                           XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                           XXMIN( 1) =       0.25465500E+03
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FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

              1                 0.52259184E+05
                                                    XT( 1) =   0.48460369E+01
                                                    XT( 2) =   0.10843732E+02

              2                 0.52259185E+05
                                                    XT( 1) =   0.48460803E+01
                                                    XT( 2) =   0.10843538E+02

              3                 0.52259185E+05
                                                    XT( 1) =   0.48460125E+01
                                                    XT( 2) =   0.10843841E+02

              4                 0.52259185E+05
                                                    XT( 1) =   0.48460606E+01
                                                    XT( 2) =   0.10843626E+02
```

********** RESTARTING "EVOP" TO CHECK THE MINIMUM

```
    INITIAL COMPLEX CONFIGURATION
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          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48460369E+01
                                                        XT( 2) =   0.10843732E+02

                2                 0.36561019E+07
                                                        XT( 1) =   0.90067887E+02
                                                        XT( 2) =   0.59122723E+02

                3                 0.98663945E+06
                                                        XT( 1) =   0.44125369E+02
                                                        XT( 2) =   0.32647717E+02

                4                 0.48158375E+07
                                                        XT( 1) =   0.98757970E+02
                                                        XT( 2) =   0.98718375E+02



OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                                NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      132
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      126
    COORDINATES OF THE MINIMUM                                                     XT( 1) =       0.48463454E+01
                                                                                   XT( 2) =       0.10842352E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                             F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                      XX( 1) =       0.25465501E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                          XMAX( 1) =       0.10000000E+03
                                                                                 XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                          XMIN( 1) =       0.00000000E+00
                                                                                 XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                         XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                         XXMIN( 1) =       0.25465500E+03



FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48460369E+01
                                                        XT( 2) =   0.10843732E+02

                2                 0.52259184E+05
                                                        XT( 1) =   0.48463454E+01
                                                        XT( 2) =   0.10842352E+02

                3                 0.52259185E+05
                                                        XT( 1) =   0.48464624E+01
                                                        XT( 2) =   0.10841828E+02

                4                 0.52259185E+05
                                                        XT( 1) =   0.48461594E+01
                                                        XT( 2) =   0.10843184E+02



************ RESTARTING "EVOP" TO CHECK THE MINIMUM



    INITIAL COMPLEX CONFIGURATION

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463454E+01
                                                        XT( 2) =   0.10842352E+02

                2                 0.74194969E+05
                                                        XT( 1) =   0.34884948E+01
                                                        XT( 2) =   0.32465607E+02

                3                 0.22981169E+07
                                                        XT( 1) =   0.63397187E+02
                                                        XT( 2) =   0.88192660E+02

                4                 0.17837562E+07
                                                        XT( 1) =   0.58581269E+02
                                                        XT( 2) =   0.57753694E+02
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OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                          NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      125
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      120
    COORDINATES OF THE MINIMUM                                                   XT( 1) =       0.48463454E+01
                                                                                 XT( 2) =       0.10842352E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                            F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                    XX( 1) =       0.25465501E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                        XMAX( 1) =       0.10000000E+03
                                                                               XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                        XMIN( 1) =       0.00000000E+00
                                                                               XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMIN( 1) =       0.25465500E+03



FINAL COMPLEX CONFIGURATION.


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                          XT( 1) =   0.48463454E+01
                                                          XT( 2) =   0.10842352E+02

                2                 0.52259185E+05
                                                          XT( 1) =   0.48462634E+01
                                                          XT( 2) =   0.10842718E+02

                3                 0.52259184E+05
                                                          XT( 1) =   0.48461489E+01
                                                          XT( 2) =   0.10843231E+02

                4                 0.52259185E+05
                                                          XT( 1) =   0.48461523E+01
                                                          XT( 2) =   0.10843216E+02



************ RESTARTING "EVOP" TO CHECK THE MINIMUM



    INITIAL COMPLEX CONFIGURATION


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                          XT( 1) =   0.48463454E+01
                                                          XT( 2) =   0.10842352E+02

                2                 0.51651244E+06
                                                          XT( 1) =   0.19290742E+02
                                                          XT( 2) =   0.95961219E+02

                3                 0.14689446E+06
                                                          XT( 1) =   0.71095801E+01
                                                          XT( 2) =   0.51327268E+02

                4                 0.22733115E+07
                                                          XT( 1) =   0.76160967E+02
                                                          XT( 2) =   0.13691035E+02



OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                          NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      131
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      125
    COORDINATES OF THE MINIMUM                                                   XT( 1) =       0.48463454E+01
                                                                                 XT( 2) =       0.10842352E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                            F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                    XX( 1) =       0.25465501E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                        XMAX( 1) =       0.10000000E+03
                                                                               XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                        XMIN( 1) =       0.00000000E+00
                                                                               XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMIN( 1) =       0.25465500E+03
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FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463454E+01
                                                        XT( 2) =   0.10842352E+02

                2                 0.52259185E+05
                                                        XT( 1) =   0.48467157E+01
                                                        XT( 2) =   0.10840695E+02

                3                 0.52259184E+05
                                                        XT( 1) =   0.48464733E+01
                                                        XT( 2) =   0.10841779E+02

                4                 0.52259184E+05
                                                        XT( 1) =   0.48464381E+01
                                                        XT( 2) =   0.10841937E+02



************ RESTARTING "EVOP" TO CHECK THE MINIMUM



    INITIAL COMPLEX CONFIGURATION

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463454E+01
                                                        XT( 2) =   0.10842352E+02

                2                 0.41029057E+07
                                                        XT( 1) =   0.96697491E+02
                                                        XT( 2) =   0.56965649E+02

                3                 0.20539509E+07
                                                        XT( 1) =   0.71516448E+02
                                                        XT( 2) =   0.16407861E+02

                4                 0.17891791E+07
                                                        XT( 1) =   0.54799145E+02
                                                        XT( 2) =   0.81124115E+02



OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                                NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      129
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      122
    COORDINATES OF THE MINIMUM                                                     XT( 1) =       0.48463517E+01
                                                                                   XT( 2) =       0.10842324E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                             F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                      XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                           XMAX( 1) =       0.10000000E+03
                                                                                  XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                           XMIN( 1) =       0.00000000E+00
                                                                                  XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                          XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                          XXMIN( 1) =       0.25465500E+03



FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463454E+01
                                                        XT( 2) =   0.10842352E+02

                2                 0.52259184E+05
                                                        XT( 1) =   0.48463517E+01
                                                        XT( 2) =   0.10842324E+02

                3                 0.52259184E+05
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                                                    XT( 1) =   0.48462884E+01
                                                    XT( 2) =   0.10842606E+02

          4                0.52259184E+05
                                                    XT( 1) =   0.48464859E+01
                                                    XT( 2) =   0.10841723E+02


********** RESTARTING "EVOP" TO CHECK THE MINIMUM


    INITIAL COMPLEX CONFIGURATION

          VERTICE NUMBER          FUNCTION VALUE              COORDINATES

          1                0.52259184E+05
                                                    XT( 1) =   0.48463517E+01
                                                    XT( 2) =   0.10842324E+02

          2                0.35460269E+07
                                                    XT( 1) =   0.93552405E+02
                                                    XT( 2) =   0.31197381E+02

          3                0.14125402E+07
                                                    XT( 1) =   0.45212629E+02
                                                    XT( 2) =   0.90499336E+02

          4                0.55001670E+06
                                                    XT( 1) =   0.36082363E+02
                                                    XT( 2) =   0.20001413E+01


OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                          NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      132
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      125
    COORDINATES OF THE MINIMUM                                                   XT( 1) =       0.48463517E+01
                                                                                 XT( 2) =       0.10842324E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                            F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                    XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                         XMAX( 1) =       0.10000000E+03
                                                                                XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                         XMIN( 1) =       0.00000000E+00
                                                                                XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                        XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                        XXMIN( 1) =       0.25465500E+03


FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE              COORDINATES

          1                0.52259184E+05
                                                    XT( 1) =   0.48463517E+01
                                                    XT( 2) =   0.10842324E+02

          2                0.52259185E+05
                                                    XT( 1) =   0.48463754E+01
                                                    XT( 2) =   0.10842217E+02

          3                0.52259185E+05
                                                    XT( 1) =   0.48462923E+01
                                                    XT( 2) =   0.10842589E+02

          4                0.52259185E+05
                                                    XT( 1) =   0.48461648E+01
                                                    XT( 2) =   0.10843160E+02


********** RESTARTING "EVOP" TO CHECK THE MINIMUM


    INITIAL COMPLEX CONFIGURATION
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```
          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463517E+01
                                                        XT( 2) =   0.10842324E+02

                2                 0.28226359E+07
                                                        XT( 1) =   0.87259579E+02
                                                        XT( 2) =   0.55562031E+01

                3                 0.11681794E+07
                                                        XT( 1) =   0.48001006E+02
                                                        XT( 2) =   0.38000214E+02

                4                 0.37505478E+07
                                                        XT( 1) =   0.95992219E+02
                                                        XT( 2) =   0.33951384E+02


OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                                NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      124
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      118
    COORDINATES OF THE MINIMUM                                                     XT( 1) =       0.48463517E+01
                                                                                   XT( 2) =       0.10842324E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                             F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                      XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                          XMAX( 1) =       0.10000000E+03
                                                                                 XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                          XMIN( 1) =       0.00000000E+00
                                                                                 XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                         XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                         XXMIN( 1) =       0.25465500E+03


FINAL COMPLEX CONFIGURATION.

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463517E+01
                                                        XT( 2) =   0.10842324E+02

                2                 0.52259185E+05
                                                        XT( 1) =   0.48469610E+01
                                                        XT( 2) =   0.10839598E+02

                3                 0.52259185E+05
                                                        XT( 1) =   0.48466015E+01
                                                        XT( 2) =   0.10841206E+02

                4                 0.52259186E+05
                                                        XT( 1) =   0.48468723E+01
                                                        XT( 2) =   0.10839994E+02


************ RESTARTING "EVOP" TO CHECK THE MINIMUM


    INITIAL COMPLEX CONFIGURATION

          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                        XT( 1) =   0.48463517E+01
                                                        XT( 2) =   0.10842324E+02

                2                 0.83978402E+06
                                                        XT( 1) =   0.39778349E+02
                                                        XT( 2) =   0.33107626E+02

                3                 0.94649005E+06
                                                        XT( 1) =   0.40640625E+02
                                                        XT( 2) =   0.45875120E+02

                4                 0.16550309E+06
                                                        XT( 1) =   0.94851010E+01
                                                        XT( 2) =   0.44034526E+02
```

```
OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                          NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      127
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      122
    COORDINATES OF THE MINIMUM                                                   XT( 1) =       0.48463517E+01
                                                                                 XT( 2) =       0.10842324E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                            F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                    XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                        XMAX( 1) =       0.10000000E+03
                                                                               XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                        XMIN( 1) =       0.00000000E+00
                                                                               XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMIN( 1) =       0.25465500E+03



FINAL COMPLEX CONFIGURATION.


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                          XT( 1) =   0.48463517E+01
                                                          XT( 2) =   0.10842324E+02

                2                 0.52259185E+05
                                                          XT( 1) =   0.48461886E+01
                                                          XT( 2) =   0.10843053E+02

                3                 0.52259185E+05
                                                          XT( 1) =   0.48462785E+01
                                                          XT( 2) =   0.10842651E+02

                4                 0.52259185E+05
                                                          XT( 1) =   0.48463060E+01
                                                          XT( 2) =   0.10842528E+02



************ RESTARTING "EVOP" TO CHECK THE MINIMUM



    INITIAL COMPLEX CONFIGURATION


          VERTICE NUMBER          FUNCTION VALUE               COORDINATES

                1                 0.52259184E+05
                                                          XT( 1) =   0.48463517E+01
                                                          XT( 2) =   0.10842324E+02

                2                 0.31096868E+07
                                                          XT( 1) =   0.78841251E+02
                                                          XT( 2) =   0.76736766E+02

                3                 0.11082530E+07
                                                          XT( 1) =   0.50849336E+02
                                                          XT( 2) =   0.14465114E+02

                4                 0.57980480E+06
                                                          XT( 1) =   0.29146686E+02
                                                          XT( 2) =   0.44694087E+02



OUTPUT SUMMARY FROM SUBROUTINE EVOP
    MINIMUM OF THE OBJECTIVE FUNCTION HAS BEEN LOCATED TO THE DESIRED DEGREE OF ACCURACY FOR CONVERGENCE.  IER = 8
    TOTAL NUMBER OF OBJECTIVE FUNCTION EVALUATION.                                          NFUNC =       31
    NUMBER OF TIMES THE SUBROUTINE FUNCTION IS CALLED DURING THE PRESENT CONVERGENCE TESTS. KUT =        6
    NUMBER OF TIMES THE EXPLICIT CONSTRAINTS WERE EVALUATED                                 KKT =      133
    NUMBER OF TIMES THE IMPLICIT CONSTRAINTS WERE EVALUATED                                   M =      127
    COORDINATES OF THE MINIMUM                                                   XT( 1) =       0.48463517E+01
                                                                                 XT( 2) =       0.10842324E+02
    OBJECTIVE FUNCTION VALUE AT THE MINIMUM                                            F =       0.52259184E+05
    IMPLICIT CONSTRAINT VALUES AT THE MINIMUM                                    XX( 1) =       0.25465500E+03
    UPPER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMUM                        XMAX( 1) =       0.10000000E+03
                                                                               XMAX( 2) =       0.10000000E+03
    LOWER BOUNDS OF EXPLICIT CONSTRAINTS AT THE MINIMIM                        XMIN( 1) =       0.00000000E+00
                                                                               XMIN( 2) =       0.00000000E+00
    UPPER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMAX( 1) =       0.10000000E+07
    LOWER BOUNDS OF IMPLICIT CONSTRAINTS AT THE MINIMUM                       XXMIN( 1) =       0.25465500E+03
```

FINAL COMPLEX CONFIGURATION.

VERTICE NUMBER	FUNCTION VALUE	COORDINATES	
1	0.52259184E+05		
		XT(1) =	0.48463517E+01
		XT(2) =	0.10842324E+02
2	0.52259184E+05		
		XT(1) =	0.48466490E+01
		XT(2) =	0.10840993E+02
3	0.52259185E+05		
		XT(1) =	0.48464465E+01
		XT(2) =	0.10841899E+02
4	0.52259184E+05		
		XT(1) =	0.48464310E+01
		XT(2) =	0.10841969E+02