HOW TO USE

SOP5

version 5.0 by A.GASPANI (August, 1994)

Stochastic Optimization Program via Analytic Centroid Method

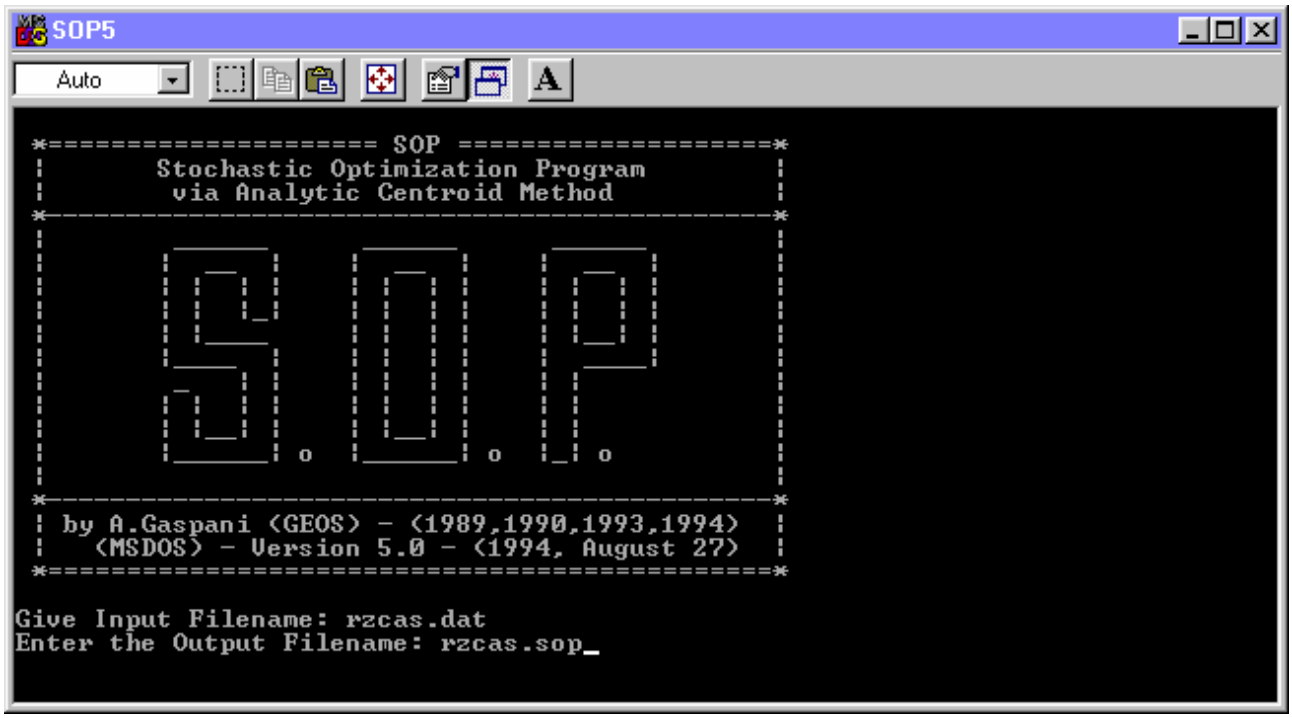
Input File: RZ CAS

Input file must be an ASCII file with the following format:

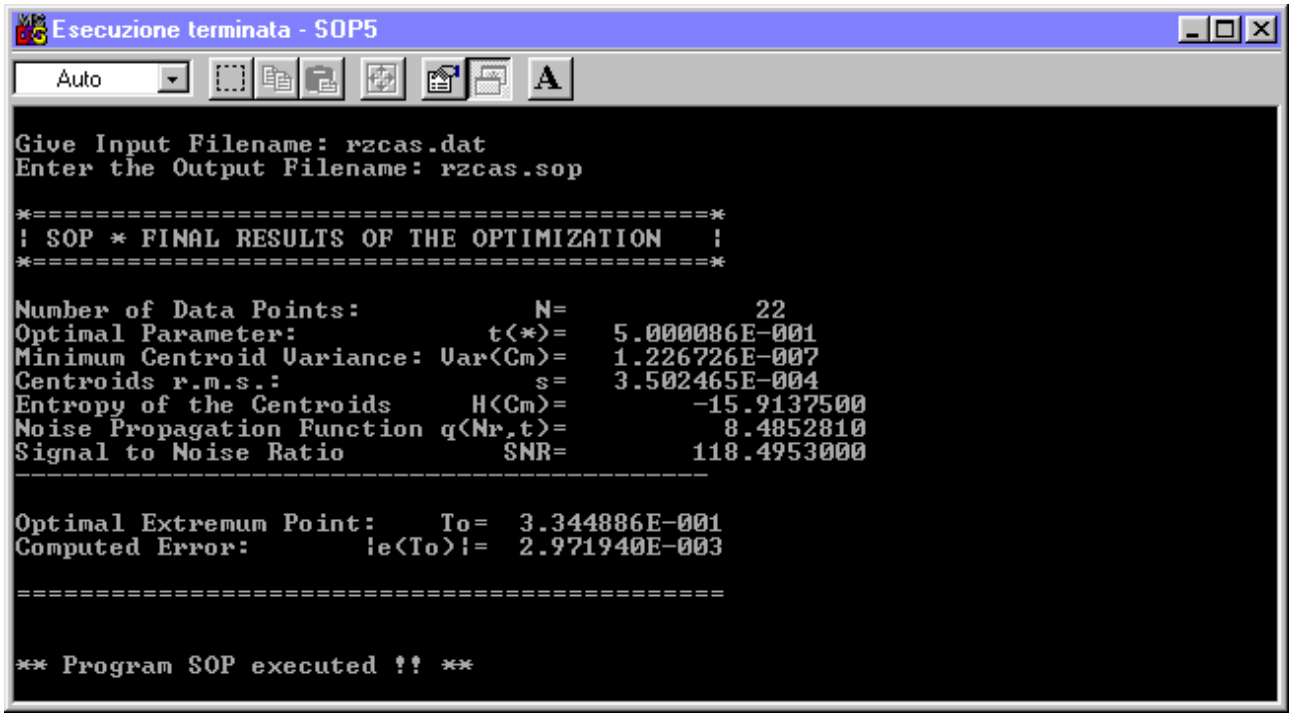
```
Time[space]Magnitude
0.2917      -6.7
0.3007      -6.9
0.3083      -7.1
...         ...
0.3639      -7.1
0.3681      -6.9
0.3750      -6.7
```

Run SOP5 computer program.

Input data filename: name of the DAT file (rzcas.dat)
Output data filename: name of the output file (rzcas.sop)



press enter



Output Files:

RZCAS.SOP

ASCII output file containing time of extremum, its error and restored signal:

```
 *================================================*
 |                   S. O. P.                     |
 |       Stochastic Optimization Program          |
 |        via Analytic Centroid Method            |
 |       by A.Gaspani,1989,1990,1993,1994         |
 |         Release 5.0 -  27 August 1994          |
 *================================================*

  ------------------------------------------
       ***   Original Time Series  x(t)   ***
  ------------------------------------------

           Point        t                x(t)

             1  2.917000E-001        -6.7000000
             2  3.007000E-001        -6.9000000
             3  3.083000E-001        -7.1000000
             4  3.146000E-001        -7.3000000
             5  3.181000E-001        -7.4000000
             6  3.201000E-001        -7.5000000
             7  3.236000E-001        -7.6000000
             8  3.264000E-001        -7.6000000
             9  3.278000E-001        -7.7000000
            10  3.313000E-001        -7.7000000
            11  3.340000E-001        -7.8000000
            12  3.361000E-001        -7.8000000
            13  3.396000E-001        -7.7000000
            14  3.417000E-001        -7.7000000
            15  3.444000E-001        -7.6000000
            16  3.472000E-001        -7.5000000
```

17	3.500000E-001	-7.4000000
18	3.528000E-001	-7.3000000
19	3.597000E-001	-7.2000000
20	3.639000E-001	-7.1000000
21	3.681000E-001	-6.9000000
22	3.750000E-001	-6.7000000

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* Extrema of the k-th Level-Set and Centroids *

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y1(S)	y2(S)	Sv(y)	T(.5,k)
2.956667E-001	3.721682E-001	-6.7916190	3.339174E-001
2.996333E-001	3.692013E-001	-6.8863640	3.344173E-001
3.036000E-001	3.659622E-001	-6.9870730	3.347811E-001
3.075667E-001	3.622782E-001	-7.0955310	3.349224E-001
3.115333E-001	3.580114E-001	-7.2116680	3.347723E-001
3.155000E-001	3.534268E-001	-7.3315230	3.344634E-001
3.194667E-001	3.489999E-001	-7.4479420	3.342333E-001
3.234333E-001	3.449045E-001	-7.5509560	3.341689E-001
3.274000E-001	3.409311E-001	-7.6319200	3.341655E-001
3.313667E-001	3.367404E-001	-7.6814030	3.340535E-001
3.353333E-001	3.353333E-001	-7.6927450	3.353333E-001
3.297127E-001	3.393000E-001	-7.6607710	3.345064E-001
3.253761E-001	3.432667E-001	-7.5906090	3.343214E-001
3.212622E-001	3.472333E-001	-7.4945720	3.342478E-001
3.174880E-001	3.512000E-001	-7.3898690	3.343440E-001
3.139913E-001	3.551667E-001	-7.2859360	3.345790E-001
3.105329E-001	3.591333E-001	-7.1823780	3.348331E-001
3.067367E-001	3.631000E-001	-7.0728370	3.349183E-001
3.022965E-001	3.670667E-001	-6.9539790	3.346816E-001
2.972039E-001	3.710333E-001	-6.8283360	3.341186E-001

---- Solution Obtained Forcing Symmetry (t=.5) ----

Optimum under Symmetry : To(.5)= 3.344889E-001
Computed Error : |e(To)|= 2.971940E-003

Centroid Variance : Var{To(.5)}= 1.226726E-007
Centroids r.m.s.: s= 3.502466E-004
Differential Entropy H(c)= -15.9137500

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* Signal Restored by the Centroids Method *

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y(S)	S(y)
2.956667E-001	-6.7916190
2.972039E-001	-6.8283360
2.996333E-001	-6.8863640
3.022965E-001	-6.9539790
3.036000E-001	-6.9870730
3.067367E-001	-7.0728370
3.075667E-001	-7.0955310
3.105329E-001	-7.1823780
3.115333E-001	-7.2116680
3.139913E-001	-7.2859360
3.155000E-001	-7.3315230

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  3.174880E-001        -7.3898690
  3.194667E-001        -7.4479420
  3.212622E-001        -7.4945720
  3.234333E-001        -7.5509560
  3.253761E-001        -7.5906090
  3.274000E-001        -7.6319200
  3.297127E-001        -7.6607710
  3.313667E-001        -7.6814030
  3.353333E-001        -7.6927450
  3.353333E-001        -7.6927450
  3.367404E-001        -7.6814030
  3.393000E-001        -7.6607710
  3.409311E-001        -7.6319200
  3.432667E-001        -7.5906090
  3.449045E-001        -7.5509560
  3.472333E-001        -7.4945720
  3.489999E-001        -7.4479420
  3.512000E-001        -7.3898690
  3.534268E-001        -7.3315230
  3.551667E-001        -7.2859360
  3.580114E-001        -7.2116680
  3.591333E-001        -7.1823780
  3.622782E-001        -7.0955310
  3.631000E-001        -7.0728370
  3.659622E-001        -6.9870730
  3.670667E-001        -6.9539790
  3.692013E-001        -6.8863640
  3.710333E-001        -6.8283360
  3.721682E-001        -6.7916190

*=========================================*
| SOP * FINAL RESULTS OF THE OPTIMIZATION   |
*=========================================*

Number of Data Points:           N=            22
Optimal Parameter:            t(*)=   5.000086E-001
Minimum Centroid Variance: Var(Cm)=   1.226726E-007
Centroids r.m.s.:                s=   3.502465E-004
Entropy of the Centroids     H(Cm)=        -15.9137500
Noise Propagation Function q(Nr,t)=          8.4852810
Signal to Noise Ratio          SNR=        118.4953000
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Optimal Extremum Point:    To=  3.344886E-001
Computed Error:       |e(To)|=  2.971940E-003

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