

NAG Toolbox for MATLAB

e04ne

1 Purpose

To supply individual optional parameters to e04nc.

2 Syntax

```
[lwsav, iwsav, rwsav, inform] = e04ne(str, lwsav, iwsav, rwsav)
```

3 Description

e04ne may be used to supply values for optional parameters to e04nc. It is only necessary to call e04ne for those parameters whose values are to be different from their default values. One call to e04ne sets one parameter value.

Each optional parameter is defined by a single character string, of up to 72 characters, consisting of one or more items. The items associated with a given option must be separated by spaces, or equals signs [=]. Alphabetic characters may be upper or lower case. The string

```
Print Level = 1
```

is an example of a string used to set an optional parameter. For each option the string contains one or more of the following items:

- a mandatory keyword;
- a phrase that qualifies the keyword;
- a number that specifies an integer or double value. Such numbers may be up to 16 contiguous characters in Fortran's I, F, E or D formats, terminated by a space if this is not the last item on the line.

Blank strings and comments are ignored. A comment begins with an asterisk (*) and all subsequent characters in the string are regarded as part of the comment.

For e04ne, each user-specified option is normally printed as it is defined, on the current advisory message unit (see x04ab), but this printing may be suppressed using the keyword **Nolist**. Thus the statement

```
[lwsav, iwsav, rwsav, inform] = e04ne('Nolist', lwsav, iwsav, rwsav);
```

suppresses printing of this and subsequent options. Printing will automatically be turned on again after a call to e04nc and may be turned on again at any time using the keyword **List**.

For e04ne printing is turned off by default, but may be turned on at any time using the keyword **List**.

Optional parameter settings are preserved following a call to e04nc and so the keyword **Defaults** is provided to allow you to reset all the optional parameters to their default values before a subsequent call to e04nc.

A complete list of optional parameters, their abbreviations, synonyms and default values is given in Section 11 of the document for e04nc.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **str** – string

A single valid option string (as described in Section 3 and in Section 11 of the document for e04nc).

2: **lwsav(120)** – logical array

3: **iwsav(610)** – int32 array

4: **rwsav(475)** – double array

The arrays **lwsav**, **iwsav** and **rwsav** **must not** be altered between calls to any of the functions e04wb, e04nc or e04ne.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **lwsav(120)** – logical array

2: **iwsav(610)** – int32 array

3: **rwsav(475)** – double array

The arrays **lwsav**, **iwsav** and **rwsav** **must not** be altered between calls to any of the functions e04wb, e04nc or e04ne.

4: **inform** – int32 scalar

Contains zero if a valid option string has been supplied and a value > 0 otherwise (see Section 6).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

inform = 5

The supplied option is invalid. Check that the keywords are neither ambiguous nor misspelt.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
c = [1, 1, 1, 1, 1, 1, 1, 1, 4;
     1, 2, 3, 4, -2, 1, 1, 1, 1;
     1, -1, 1, -1, 1, 1, 1, 1, 1];
b1 = [-2;
      -2;
```

```

-2;
-2;
-2;
-2;
-2;
-2;
-2;
-2;
-2;
-2;
-2];
bu = [2;
2;
2;
2;
2;
2;
2;
2;
2;
2;
1.5;
1.5;
4];
cvec = [-4;-1;-1;-1;-1;-1;-1;-0.1;-0.3];
istate= zeros(12, 1, 'int32');
kx = zeros(9, 1, 'int32');
x = zeros(9,1);
a = [2.0  1.0  1.0  1.0  1.0  0.0  0.0  0.0  0.0;
1.0,  2.0,  1.0,  1.0,  1.0,  0.0,  0.0,  0.0,  0.0;
1.0,  1.0,  2.0,  1.0,  1.0,  0.0,  0.0,  0.0,  0.0;
1.0,  1.0,  1.0,  2.0,  1.0,  0.0,  0.0,  0.0,  0.0;
1.0,  1.0,  1.0,  1.0,  2.0,  0.0,  0.0,  0.0,  0.0;
0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0;
0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0;
0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0;
0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0,  0.0];
b = [0];

[cwsav,lwsav,iwsav,rwsav,ifail] = e04wb('e04nc');
[lwsav, iwsav, rwsav, inform] = e04ne('Problem Type = QP2', lwsav, iwsav,
rwsav);
[lwsav, iwsav, rwsav, inform] = e04ne('Iteration Limit = 30', lwsav,
iwsav, rwsav);
[lwsav, iwsav, rwsav, inform] = e04ne('Print Level = 1', lwsav, iwsav,
rwsav);
[lwsav, iwsav, rwsav, inform] = e04ne('Infinite Bound Size = 1d25',
lwsav, iwsav, rwsav);

[istateOut, kxOut, xOut, aOut, bOut, iter, obj, clamda, lwsavOut,
iwsavOut, rwsavOut, ifail] = ...
    e04nc(c, bl, bu, cvec, istate, kx, x, a, b, lwsav, iwsav, rwsav)

```

*** E04NCF

Parameters

Problem type.....	QP2	Hessian.....	
NO			
Linear constraints.....	3	Feasibility tolerance..	1.05E-08
Variables.....	9	Crash tolerance.....	1.00E-02
Objective matrix rows..	9	Rank tolerance.....	1.05E-07
Infinite bound size....	1.00E+25	COLD start.....	
Infinite step size.....	1.00E+25	EPS (machine precision)	1.11E-16

```

Print level.....          1          Feasibility phase itns.
60
Monitoring file.....      -1          Optimality  phase itns.
30

Workspace provided is      IWORK(      9),  WORK(      270).
To solve problem we need  IWORK(      9),  WORK(      270).

Rank of the objective function data matrix =      5

Exit from QP problem after      12 iterations.

  Varbl State      Value      Lower Bound      Upper Bound      Lagr Mult
Slack
  V   1   UL      2.00000      -2.00000      2.00000      -0.8000      .
  V   2   FR      -0.233333      -2.00000      2.00000      .
1.767
  V   3   FR      -0.266667      -2.00000      2.00000      .
1.733
  V   4   FR      -0.300000      -2.00000      2.00000      .
1.700
  V   5   FR      -0.100000      -2.00000      2.00000      .
1.900
  V   6   UL      2.00000      -2.00000      2.00000      -0.9000      .
  V   7   UL      2.00000      -2.00000      2.00000      -0.9000      .
  V   8   FR      -1.77778      -2.00000      2.00000      .
0.2222
  V   9   FR      -0.455556      -2.00000      2.00000      .
1.544

  L Con State      Value      Lower Bound      Upper Bound      Lagr Mult
Slack
  L   1   UL      1.50000      -2.00000      1.50000      -6.6667E-02
1.1102E-15
  L   2   UL      1.50000      -2.00000      1.50000      -3.3333E-02 -
4.4409E-16
  L   3   FR      3.93333      -2.00000      4.00000      .
6.6667E-02

Exit E04NCF - Optimal QP solution.

Final QP objective value =      -8.067778
istateOut =
      2
      0
      0
      0
      0
      2
      2
      0
      0
      2
      2
      0
kxOut =
      2
      3
      4
      5
      9
      8
      7
      6
      1

```

```

xOut =
  2.0000
 -0.2333
 -0.2667
 -0.3000
 -0.1000
  2.0000
  2.0000
 -1.7778
 -0.4556
aOut =
Columns 1 through 7
  1.0000   -0.0000    0.0000    0.0000   -0.0000   -0.0000   -0.0000
  1.0000   -1.6092    0.8025   -0.0935    0.6721   -0.9175    0.0000
  1.0000    1.0000    0.5519    0.8245    0.4104   -0.2185    0.0000
  1.0000    1.0000    1.0000    0.3107   -1.0508    0.2504    0.0000
  1.0000    1.0000    1.0000    1.0000         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0         0
         0         0         0         0         0         0         0
Columns 8 through 9
 -0.0000    0.0000
 -0.0000    0.8409
 -0.0000    0.2003
 -0.0000   -0.2295
         0   -1.0954
         0         0
         0         0
         0         0
         0         0
bOut =
  0
iter =
    12
obj =
 -8.0678
clamda =
 -0.8000
         0
         0
         0
         0
 -0.9000
 -0.9000
         0
         0
 -0.0667
 -0.0333
         0
lwsavOut =
    array elided
iwsavOut =
    array elided
rwsavOut =
    array elided
ifail =
    0

```