NAG Toolbox for Matlab

e05jg

1 Purpose

e05jg may be used to supply individual real optional parameters to e05jb. The initialization function e05ja **must** have been called before calling e05jg.

2 Syntax

```
[comm, ifail] = e05jg(optstr, rvalue, comm)
```

3 Description

e05jg may be used to supply values for real optional parameters to e05jb. It is only necessary to call e05jg for those parameters whose values are to be different from their default values. One call to e05jg sets one parameter value.

Each real optional parameter is defined by a single character string in **optstr** and the corresponding value in **rvalue**. For example the following illustrates how the local searches tolerance could be defined:

```
loctol = 1.0D-10;
[comm, ifail] = e05jg('Local Searches Tolerance', loctol, comm);
```

A complete list of optional parameters, their symbolic names and default values is given in Section 11 in e05jb.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **optstr – string**

A valid real-valued optional parameter (as described in Section 11 in e05jb).

2: **rvalue – double scalar**

The value associated with the keyword in **optstr**.

3: **comm**(*lcomm*) **– double array**

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

lcomm

5.4 Output Parameters

1: **comm**(*lcomm*) **– double array**

comm must not be altered between calls to any of the functions e05jb, e05jd, e05je, e05jf, e05jg, e05jh, e05jj, e05jk and e05jl.

2: **ifail – int32 scalar**

ifail = 0 unless the function detects an error (see Section 6).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

On entry, $lcomm < 100$,
or the initialization function e05ja has not been called.

ifail = 2

The optional parameter given in **optstr** is invalid. The correct number of word 'tokens' are present but a keyword or keyword combination is invalid.

ifail = 3

The numerical value to be set is out of range with respect to optional parameter given in **optstr**. See Section 11 in e05jb for allowable values of the optional parameters.

ifail = 4

The optional-parameter name contained the wrong number of word 'tokens', so could not be recognized by the function.

7 Accuracy

Not applicable.

8 Further Comments

e05jd may also be used to supply real optional parameters to e05jb.

9 Example

```
% Problem data for peaks function
prob = 'peaks';
xres = 100;
yres = 100;

bl = [-3; -3];
bu = -bl;
fglob = -6.55; % Approx.
xglob = [0.23; -1.63]; % Approx.



% Initialize e05jb
n = int32(length(bl));
[comm, ifail] = e05ja(n);

if (ifail == 0)

    % Vanilla call.
    disp(sprintf('\n'));
    disp('Solve with no options or init.-list data');

    ibound = int32(0);             % All bounds will be given;
    iinit = int32(0);              % Default initialization method;
     list = zeros(n,3);               % Only need to _declare_ the init.-
```

```
list
       numpts = zeros(n, 1, 'int32'); % data: these will be _set_
internally.
    initpt = zeros(n, 1, 'int32');

    [bl, bu, listOut, numptsOut, initptOut, ...
     xbest, obj, comm, userOut, ifail] = ...
        e05jb('e05jb_objective', ibound, iinit, bl, bu, list, ...
              numpts, initpt, 'e05jb_monitor', comm);

    disp(['e05jb (no options) exited with ifail = ' num2str(ifail)]);

    if (ifail == 0)
        disp('xbest:');
        disp(xbest);
        disp(['obj = ' num2str(obj)]);
    end

    % Set some options. No need to reinitialize: n hasn't changed, and we
    % didn't set any options above.
    disp(sprintf('\n'));
    disp('Solve with options and init.-list data');

    % Echo the setting of opt. params.
    comm = e05jd('List', comm);

    comm = e05jd('Function Evaluations Limit = 100000', comm);
    comm = e05jf('Static Limit', 3*n, comm);

    % Increase infbnd by factor of 10.
    infbnd = e05jl('Infinite Bound Size', comm);
    comm = e05jg('Infinite Bound Size', 10*infbnd, comm);

    comm = e05je('Local Searches', 'on', comm);

    % Set the initialization-list data.
     iinit = int32(3);                          % We're providing the data
this time:
    list = zeros(n, 3);
    list(:, 1) = bl; list(:, 3) = bu;
    list(:, 2) = [-1; 0];
     numpts = int32(3)*ones(n, 1, 'int32'); % 3 splitting points for each
dim;
    initpt = int32(2)*ones(n, 1, 'int32'); % 2nd pt in each row to be the
'init.' pt.

    [bl, bu, listOut, numptsOut, initptOut, ...
     xbest, obj, comm, userOut, ifail] = ...
        e05jb('e05jb_objective', ibound, iinit, bl, bu, list, ...
              numpts, initpt, 'e05jb_monitor', comm);

    disp(['e05jb (options) exited with ifail = ' num2str(ifail)]);

    if (ifail == 0)
        disp('xbest:');
        disp(xbest);
        disp(['obj = ' num2str(obj)]);
    end

end
```

```
Solve with no options or init.-list data


(OBJFUN was just called for the first time)


*** Begin monitoring information ***
```

```
Total sub-boxes = 228
Total function evaluations = 196
Total function evaluations used in local searches = 87
Total points used in local search = 13
Total sweeps through levels = 12
Total splits by init. list = 5
Lowest level with nonsplit boxes = 7
Number of candidate minima in the 'shopping basket' = 2
Shopping basket:
   -1.3474    0.2283
    0.2045   -1.6255


*** End monitoring information ***


e05jb (no options) exited with ifail = 0
xbest:
    0.2283
   -1.6255
obj = -6.5511


Solve with options and init.-list data
      Function Evaluations Limit = 100000
      Static Limit               6
      Infinite Bound Size    1.1579208923731620E+78
      Local Searches on


(OBJFUN was just called for the first time)


*** Begin monitoring information ***


Total sub-boxes = 146
Total function evaluations = 169
Total function evaluations used in local searches = 102
Total points used in local search = 7
Total sweeps through levels = 7
Total splits by init. list = 5
Lowest level with nonsplit boxes = 4
Number of candidate minima in the 'shopping basket' = 2
Shopping basket:
    0.2283   -1.3474
   -1.6255    0.2045


*** End monitoring information ***


e05jb (options) exited with ifail = 0
xbest:
    0.2283
   -1.6255
obj = -6.5511
```