NAG Toolbox for Matlab

e05je

1 Purpose

e05je may be used to supply individual 'ON'/'OFF'-valued character optional parameters to e05jb. The initialization function e05ja **must** have been called before calling e05je.

2 Syntax

```
[comm, ifail] = e05je(optstr, cvalue, comm)
```

3 Description

e05je may be used to supply values for 'ON'/'OFF'-valued character optional parameters to e05jb. It is only necessary to call e05je for those parameters whose values are to be different from their default values. One call to e05je sets one parameter value.

Each 'ON'/'OFF'-valued character optional parameter is defined by a single character string in **optstr** and the corresponding value in **cvalue**. For example, the following allows local searches to be turned off:

```
lcsrch = 'off';
[comm, ifail] = e05je('Local Searches', lcsrch, 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 'ON'/'OFF'-valued character optional parameter (as described in Section 11 in e05jb).

2: **cvalue – string**

The 'ON'/'OFF' 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

Either the optional-parameter given in **optstr** is invalid (the correct number of word 'tokens' are present, but a keyword or keyword combination is not valid) or the string given in **cvalue** is not a valid value to be taken by the optional-parameter supplied in **optstr**.

ifail = 3

The optional-parameter given in **optstr** is not associated with an 'ON'/'OFF' value. See Section 11 in e05jb for a full list of the optional parameters.

7 Accuracy

Not applicable.

8 Further Comments

e05jd may also be used to supply 'ON'/'OFF'-valued character 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 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
```