

NAG Toolbox

nag_opt_init (e04wb)

1 Purpose

nag_opt_init (e04wb) is used to initialize functions nag_opt_uncon_conjgrd_comp (e04dg), nag_opt_lp_solve (e04mf), nag_opt_lsq_lincon_solve (e04nc), nag_opt_qp_dense_solve (e04nf), nag_opt_qpconvex1_sparse_solve (e04nk), nag_opt_nlp1_solve (e04uc), nag_opt_nlp1_rcomm (e04uf), nag_opt_nlp1_sparse_solve (e04ug) and nag_opt_lsq_gencon_deriv (e04us).

2 Syntax

```
[cwsav, lwsav, iwsav, rwsav, ifail] = nag_opt_init(routine)
[cwsav, lwsav, iwsav, rwsav, ifail] = e04wb(routine)
```

3 Description

nag_opt_init (e04wb) initializes some or all of the arrays **cwsav**, **lwsav**, **iwsav** and **rwsav** for the function specified by **routine**, and any associated option setting functions.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

- 1: **routine** – CHARACTER(*)
The name of the function to be initialized.
Constraint: **routine** must be a valid function name.

5.2 Optional Input Parameters

None.

5.3 Output Parameters

- 1: **cwsav**(*lcwsav*) – CHARACTER(80) array
2: **lwsav**(*llwsav*) – LOGICAL array
3: **iwsav**(*liwsav*) – INTEGER array
4: **rwsav**(*lrwsav*) – REAL (KIND=nag_wp) array
5: **ifail** – INTEGER
ifail = 0 unless the function detects an error (see Section 5).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

The function name supplied in **routine** is invalid

ifail = 2

One or more of the workspace array lengths *lcwsav*, *llwsav*, *liwsav* or *lrwsav* is too small.

ifail = -99

An unexpected error has been triggered by this routine. Please contact NAG.

ifail = -399

Your licence key may have expired or may not have been installed correctly.

ifail = -999

Dynamic memory allocation failed.

7 Accuracy

Not applicable.

8 Further Comments

The time taken by `nag_opt_init` (e04wb) is negligible.

9 Example

The use of `nag_opt_init` (e04wb) is illustrated by the example programs of the functions listed in Section 1.

9.1 Program Text

```
function e04wb_example

fprintf('e04wb example results\n\n');

x = [-1  1];
% Initialize
[cwsav,lwsav,iwsav,rwsav,ifail] = e04wb('e04dg');

% Optimize
[iter, objf, objgrd, x, user, lwsav, iwsav, rwsav, ifail] = ...
e04dg( ...
    @objfun, x, lwsav, iwsav, rwsav);

fprintf('Variable          Value      Gradient value\n');
for i=1:2
    fprintf('Varbl %3d      %12.8f      %9.1e\n', i, x(i), objgrd(i));
end
fprintf('\nFinal objective value = %15.7e\n',objf);

function [mode, objf, objgrd, user] = objfun(mode, n, x, nstate, user)

    expx1 = exp(x(1));
    objf = expx1*(4*x(1)^2+2*x(2)^2+4*x(1)*x(2)+2*x(2)+1);
    if (mode == 2)
```

```
objgrd(1) = 4*expx1*(2*x(1)+x(2)) + objf;  
objgrd(2) = 2*expx1*(2*x(2)+2*x(1)+1);  
else  
objgrd = zeros(2,1);  
end
```

9.2 Program Results

e04wb example results

Variable		Value	Gradient value
Varbl	1	0.50000001	9.1e-07
Varbl	2	-0.99999989	8.3e-07

Final objective value = 5.3083002e-14
