

NAG Toolbox for MATLAB

e04wc

1 Purpose

e04wc is used to initialize the function e04wd.

2 Syntax

```
[iw, rw, ifail] = e04wc()
```

3 Description

e04wc initializes the arrays **iw** and **rw** for the function e04wd.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

None.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

leniw, lenrw

5.4 Output Parameters

1: **iw(leniw)** – int32 array

2: **rw(lenrw)** – double array

3: **ifail** – int32 scalar

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

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

One or more of the communication array lengths **leniw** or **lenrw** is less than 600.

7 Accuracy

Not applicable.

8 Further Comments

The time taken by e04wc is negligible.

9 Example

e04wd_confun.m

```
function [mode, ccon, cjac, user] = ...
    confun(mode, ncnln, n, ldcj, needc, x, cjac, nstate, user)
    ccon = zeros(ncnln, 1);

    if (nstate == 1)
    % first call to confun. set all jacobian elements to zero.
    % note that this will only work when 'derivative level = 3'
    % (the default; see section 11.2).
        cjac = zeros(ncnln, n);
    end

    if (needc(1) > 0)
        if (mode == 0 || mode == 2)
            ccon(1) = x(1)^2 + x(2)^2 + x(3)^2 + x(4)^2;
        end

        if (mode == 1 || mode == 2)
            cjac(1,1) = 2*x(1);
            cjac(1,2) = 2*x(2);
            cjac(1,3) = 2*x(3);
            cjac(1,4) = 2*x(4);
        end
    end

    if (needc(2) > 0)
        if (mode == 0 || mode == 2)
            ccon(2) = x(1)*x(2)*x(3)*x(4);
        end

        if (mode == 1 || mode == 2)
            cjac(2,1) = x(2)*x(3)*x(4);
            cjac(2,2) = x(1)*x(3)*x(4);
            cjac(2,3) = x(1)*x(2)*x(4);
            cjac(2,4) = x(1)*x(2)*x(3);
        end
    end
end
```

e04wd_objfun.m

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

    if (mode == 0 || mode == 2)
        objf = x(1)*x(4)*(x(1)+x(2)+x(3)) + x(3);
    end

    if (mode == 1 || mode == 2)
        grad(1) = x(4)*(2*x(1)+x(2)+x(3));
        grad(2) = x(1)*x(4);
        grad(3) = x(1)*x(4) + 1;
        grad(4) = x(1)*(x(1)+x(2)+x(3));
    end
end
```

```
a = [1, 1, 1, 1];
b1 = [1, 1, 1, 1, -1e25, -1e25, 25];
bu = [5, 5, 5, 5, 20, 40, 1e25];
```

```

istate = zeros(7, 1, 'int32');
ccon = zeros(2,1);
cjac = zeros(2,4);
clamda = zeros(7,1);
hess = zeros(4,4);
x = [1; 5; 5; 1];
[iw, rw, ifail] = e04wc();
[majits, istateOut, ccon, cjacOut, clamdaOut, objf, grad, hessOut, xOut,
iwOut, rwOut, user, ifail] = ...
    e04wd(a, bl, bu, 'e04wd_confun', 'e04wd_objfun', istate, ccon, cjac,
clamda, hess, x, iw, rw)

```

```

majits =
        6
istateOut =
        1
         0
         0
         0
         1
         2
         1
ccon =
    40.0000
    25.0000
cjacOut =
    2.0000    9.4860    7.6423    2.7588
    25.0000    5.2709    6.5425    18.1237
clamdaOut =
    1.0879
   -0.0000
    0.0000
   -0.0000
         0
   -0.1615
    0.5523
objf =
    17.0140
grad =
    14.5723
     1.3794
     2.3794
     9.5641
hessOut =
    1.8647   -0.1748   -0.5895    1.1249
   -0.1748    1.0068   -0.1477    0.2699
   -0.5895   -0.1477    0.8149    0.3146
    1.1249    0.2699    0.3146    0.8969
xOut =
    1.0000
    4.7430
    3.8212
    1.3794
iwOut =
    array elided
rwOut =
    array elided
user =
     0
ifail =
     0

```