

NAG Library Function Document

nag_opt_handle_set_linobj (e04rec)

1 Purpose

nag_opt_handle_set_linobj (e04rec) is a part of the NAG optimization modelling suite and defines the linear objective function of the problem.

2 Specification

```
#include <nag.h>
#include <nage04.h>

void nag_opt_handle_set_linobj (void *handle, Integer nvar,
    const double cvec[], NagError *fail)
```

3 Description

After the initialization function nag_opt_handle_init (e04rac) has been called, nag_opt_handle_set_linobj (e04rec) may be used to define the objective function of the problem as a linear function $c^T x$ unless the objective function has already been defined by nag_opt_handle_set_linobj (e04rec), nag_opt_handle_set_quadobj (e04rfc) or by nag_opt_handle_set_nlnobj (e04rgc). This will typically be used for linear semidefinite programming problems (SDP)

$$\begin{aligned} \text{minimize}_{x \in \mathbb{R}^n} \quad & c^T x & (a) \\ \text{subject to} \quad & \sum_{i=1}^n x_i A_i^k - A_0^k \succeq 0, \quad k = 1, \dots, m_A & (b) \\ & l_B \leq Bx \leq u_B & (c) \\ & l_x \leq x \leq u_x & (d) \end{aligned} \tag{1}$$

or SDP with bilinear matrix inequalities (BMI-SDP) where the objective function has only linear terms. See nag_opt_handle_init (e04rac) for more details.

4 References

None.

5 Arguments

- 1: **handle** – void * *Input*
On entry: the handle to the problem. It needs to be initialized by nag_opt_handle_init (e04rac) and **must not** be changed.
- 2: **nvar** – Integer *Input*
On entry: n , the number of decision variables x in the problem. It must be unchanged from the value set during the initialization of the handle by nag_opt_handle_init (e04rac).
- 3: **cvec[nvar]** – const double *Input*
On entry: the dense vector c of the objective function.

4: **fail** – NagError *

Input/Output

The NAG error argument (see Section 2.7 in How to Use the NAG Library and its Documentation).

6 Error Indicators and Warnings

NE_ALLOC_FAIL

Dynamic memory allocation failed.

See Section 3.2.1.2 in How to Use the NAG Library and its Documentation for further information.

NE_ALREADY_DEFINED

The objective function has already been defined.

NE_BAD_PARAM

On entry, argument *<value>* had an illegal value.

NE_HANDLE

The supplied **handle** does not define a valid handle to the data structure for the NAG optimization modelling suite. It has not been initialized by `nag_opt_handle_init` (e04rac) or it has been corrupted.

NE_INTERNAL_ERROR

An internal error has occurred in this function. Check the function call and any array sizes. If the call is correct then please contact NAG for assistance.

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

See Section 3.6.6 in How to Use the NAG Library and its Documentation for further information.

NE_NO_LICENCE

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

See Section 3.6.5 in How to Use the NAG Library and its Documentation for further information.

NE_PHASE

The problem cannot be modified in this phase any more, the solver has already been called.

NE_REF_MATCH

On entry, **nvar** = *<value>*, expected value = *<value>*.

Constraint: **nvar** must match the value given during initialization of **handle**.

7 Accuracy

Not applicable.

8 Parallelism and Performance

`nag_opt_handle_set_linobj` (e04rec) is not threaded in any implementation.

9 Further Comments

None.

10 Example

See Section 10 in `nag_opt_handle_init` (e04rac) for links to all examples in the suite.
