

NAG C Library Function Document

nag_dtr_load (f16qgc)

1 Purpose

nag_dtr_load (f16qgc) initialises a real triangular matrix.

2 Specification

```
void nag_dtr_load (Nag_OrderType order, Nag_UploType uplo, Integer n, double alpha,
                  double diag, double a[], Integer pda, NagError *fail)
```

3 Description

nag_dtr_load (f16qgc) forms the real n by n triangular matrix A given by

$$a_{ij} = \begin{cases} \text{diag} & \text{if } i = j \\ \text{alpha} & \text{if } i \neq j \end{cases}$$

4 References

None.

5 Parameters

- 1: **order** – Nag_OrderType *Input*
On entry: the **order** parameter specifies the two-dimensional storage scheme being used, i.e., row-major ordering or column-major ordering. C language defined storage is specified by **order** = **Nag_RowMajor**. See Section 2.2.1.4 of the Essential Introduction for a more detailed explanation of the use of this parameter.
Constraint: **order** = **Nag_RowMajor** or **Nag_ColMajor**.
- 2: **uplo** – Nag_UploType *Input*
On entry: specifies whether the upper or lower triangular part of A is stored as follows:
 if **uplo** = **Nag_Upper**, the upper triangular part of A is stored;
 if **uplo** = **Nag_Lower**, the lower triangular part of A is stored.
Constraint: **uplo** = **Nag_Upper** or **Nag_Lower**.
- 3: **n** – Integer *Input*
On entry: n , the order of the matrix A .
Constraint: $n \geq 0$.
- 4: **alpha** – double *Input*
On entry: the value to be assigned to the off-diagonal elements of A .
- 5: **diag** – double *Input*
On entry: the value to be assigned to the diagonal elements of A .
- 6: **a**[*dim*] – double *Output*
Note: the dimension, *dim*, of the array **a** must be at least $\max(1, \text{pda} \times n)$.

If **order** = **Nag_ColMajor**, the (i, j) th element of the matrix A is stored in $\mathbf{a}[(j-1) \times \mathbf{pda} + i - 1]$ and if **order** = **Nag_RowMajor**, the (i, j) th element of the matrix A is stored in $\mathbf{a}[(i-1) \times \mathbf{pda} + j - 1]$.

On exit: the n by n triangular matrix A . If **uplo** = **Nag_Upper**, A is upper triangular and the elements of the array below the diagonal are not referenced; if **uplo** = **Nag_Lower**, A is lower triangular and the elements of the array above the diagonal are not referenced.

7: **pda** – Integer *Input*

On entry: the stride separating matrix row or column elements (depending on the value of **order**) in the array **a**.

Constraint: **pda** $\geq \max(1, \mathbf{n})$.

8: **fail** – NagError * *Input/Output*

The NAG error parameter (see the Essential Introduction).

6 Error Indicators and Warnings

NE_INT

On entry, **n** = $\langle value \rangle$.

Constraint: **n** ≥ 0 .

On entry, **pda** = $\langle value \rangle$.

Constraint: **pda** $\geq \max(1, \mathbf{n})$.

NE_BAD_PARAM

On entry, parameter $\langle value \rangle$ had an illegal value.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.