NAG C Library Function Document

nzg_ztr_load (f16tgc)

1 Purpose

nzg_ztr_load (f16tgc) initialises a complex triangular matrix.

2 Specification

void nag_ztr_load (Nag_OrderType order, Nag_UploType uplo, Integer n,
                   Complex alpha, Complex diag, Complex a[], Integer pda, NagError *fail)

3 Description

nzg_ztr_load (f16tgc) forms the complex \( n \) by \( n \) triangular matrix \( A \) given by

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

4 References

None.

5 Parameters

1: order – Nag_OrderType

   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

   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

   On entry: \( n \), the order of the matrix \( A \).

   Constraint: \( n \geq 0 \).

4: alpha – Complex

   On entry: the value to be assigned to the off-diagonal elements of \( A \).

5: diag – Complex

   On entry: the value to be assigned to the diagonal elements of \( A \).

6: a[dim] – Complex

   Note: the dimension, dim, of the array a must be at least max(1, pda \times n).
If \( \text{order} = \text{Nag\_ColMajor} \), the \((i, j)\)th element of the matrix \( A \) is stored in \( a[(j - 1) \times \text{pda} + i - 1] \) and if \( \text{order} = \text{Nag\_RowMajor} \), the \((i, j)\)th element of the matrix \( A \) is stored in \( a[(i - 1) \times \text{pda} + j - 1] \).

On exit: the \( n \) by \( n \) triangular matrix \( A \). If \( \text{uplo} = \text{Nag\_Upper} \), \( A \) is upper triangular and the elements of the array below the diagonal are not referenced; if \( \text{uplo} = \text{Nag\_Lower} \), \( A \) is lower triangular and the elements of the array above the diagonal are not referenced.

7: \( \text{pda} \) – Integer

\( \text{Input} \)

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

\( \text{Constraint:} \ \text{pda} \geq \max(1, n). \)

8: \( \text{fail} \) – NagError *

\( \text{Input/Output} \)

The NAG error parameter (see the Essential Introduction).

6 Error Indicators and Warnings

NE\_INT

On entry, \( n = \langle \text{value} \rangle \).

\( \text{Constraint:} \ n \geq 0. \)

On entry, \( \text{pda} = \langle \text{value} \rangle \).

\( \text{Constraint:} \ \text{pda} \geq \max(1, n). \)

NE\_BAD\_PARAM

On entry, parameter \( \langle \text{value} \rangle \) had an illegal value.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.