NAG C Library Function Document

nag_dge_copy (f16qfc)

1 Purpose

nag_dge_copy (f16qfc) copies a real general matrix.

2 Specification

```
void nag_dge_copy (Nag_OrderType order, Nag_TransType trans, Integer m, Integer n,
     const double a[], Integer pda, double b[], Integer pdb, NagError *fail)
```

3 Description

nag_dge_copy (f16qfc) performs the matrix-copy operation

$$B \leftarrow A \quad \text{or} \quad B \leftarrow A^T$$

where A and B are m by n real rectangular matrices.

4 References

The BLAS Technical Forum Standard (2001) *www.netlib.org/blas/blast-forum*

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: **trans** – Nag_TransType *Input*

On entry: specifies the operation to be performed as follows:

if **trans** = **Nag_NoTrans**, $B \leftarrow A$;

if **trans** = **Nag_Trans** or **Nag_ConjTrans**, $B \leftarrow A^T$.

Constraint: **trans** = **Nag_NoTrans**, **Nag_Trans** or **Nag_ConjTrans**.

3: **m** – Integer *Input*

On entry: m, the number of rows of the matrix A.

Constraint: **m** ≥ 0.

4: **n** – Integer *Input*

On entry: n, the number of columns of the matrix A.

Constraint: **n** ≥ 0.

5: **a**$[dim]$ – const double *Input*

Note: the dimension, dim, of the array **a** must be at least $\max(1, \textbf{pda} \times \textbf{n})$ when **order** = **Nag_ColMajor** and at least $\max(1, \textbf{pda} \times \textbf{m})$ when **order** = **Nag_RowMajor**.

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 entry: the m by n general matrix A.

6: **pda** – Integer *Input*

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

Constraints:

if **order** = **Nag_ColMajor**, **pda** $\geq \max(1, \mathbf{m})$;
if **order** = **Nag_RowMajor**, **pda** $\geq \max(1, \mathbf{n})$.

7: **b**$[dim]$ – double *Output*

Note: the dimension, dim, of the array **b** must be at least
$\max(1, \mathbf{pdb} \times \mathbf{m})$ when **trans** = **Nag_NoTrans**;
$\max(1, \mathbf{pdb} \times \mathbf{n})$ when and **order** = **Nag_ColMajor**;
$\max(1, \mathbf{pdb} \times \mathbf{m})$ when and **order** = **Nag_RowMajor**.

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

On exit: the matrix B; B is m by n if **trans** = **Nag_NoTrans**, or n by m otherwise.

8: **pdb** – Integer *Input*

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

Constraints:

if **order** = **Nag_ColMajor**,
  if **trans** = **Nag_NoTrans**, **pdb** $\geq \max(1, \mathbf{m})$;
  otherwise **pdb** $\geq \max(1, \mathbf{n})$;

if **order** = **Nag_RowMajor**,
  if **trans** = **Nag_NoTrans**, **pdb** $\geq \max(1, \mathbf{n})$;
  otherwise **pdb** $\geq \max(1, \mathbf{m})$.

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

The NAG error parameter (see the Essential Introduction).

6 Error Indicators and Warnings

NE_INT

On entry, **m** = ⟨*value*⟩.
Constraint: **m** ≥ 0.

On entry, **n** = ⟨*value*⟩.
Constraint: **n** ≥ 0.

On entry, **pda** = ⟨*value*⟩.
Constraint: **pda** $\geq \max(1, \mathbf{n})$.

On entry, **pdb** = ⟨*value*⟩.
Constraint: **pdb** $\geq \max(1, \mathbf{n})$.

NE_BAD_PARAM

On entry, parameter ⟨*value*⟩ had an illegal value.

7 Accuracy

The BLAS standard requires accurate implementations which avoid unnecessary over/underflow (see section 2.7 of The BLAS Technical Forum Standard (2001)).

8 Further Comments

None.

9 Example

See Section 9 of the document for nag_dgerfs (f07ahc).