NAG Library Routine Document

F06RDF

Note: before using this routine, please read the Users' Note for your implementation to check the interpretation of **bold italicised** terms and other implementation-dependent details.

1 Purpose

F06RDF returns, via the function name, the value of the 1-norm, the ∞-norm, the Frobenius norm, or the maximum absolute value of the elements of a real n by n symmetric matrix, stored in packed form.

2 Specification

```
FUNCTION F06RDF (NORM, UPLO, N, AP, WORK)

REAL (KIND=nag_wp) F06RDF
INTEGER            N
REAL (KIND=nag_wp) AP(*), WORK(*)
CHARACTER(1)       NORM, UPLO
```

3 Description

None.

4 References

None.

5 Parameters

1:      NORM – CHARACTER(1)   *Input*

On entry: specifies the value to be returned.

NORM = '1' or 'O'
        The 1-norm.

NORM = 'I'
        The ∞-norm (= the 1-norm for a symmetric matrix).

NORM = 'F' or 'E'
        The Frobenius (or Euclidean) norm.

NORM = 'M'
        The value $\max_{i,j} \left| a_{ij} \right|$ (not a norm).

Constraint: NORM = '1', 'O', 'I', 'F', 'E' or 'M'.

2:      UPLO – CHARACTER(1)   *Input*

On entry: specifies whether the upper or lower triangular part of A is stored.

UPLO = 'U'
        The upper triangular part of A is stored.

UPLO = 'L'
        The lower triangular part of A is stored.

Constraint: UPLO = 'U' or 'L'.

3:     N – INTEGER   *Input*

On entry: n, the order of the matrix A.

When N = 0, F06RDF returns zero.

Constraint: N ≥ 0.

4:     AP(∗) – REAL (KIND=nag_wp) array   *Input*

Note: the dimension of the array AP must be at least N × (N + 1)/2.

On entry: the n by n symmetric matrix A, packed by columns.

More precisely,

if UPLO = 'U', the upper triangle of A must be stored with element A_{ij} in AP$(i + j(j - 1)/2)$ for $i \leq j$;

if UPLO = 'L', the lower triangle of A must be stored with element A_{ij} in AP$(i + (2n - j)(j - 1)/2)$ for $i \geq j$.

5:     WORK(∗) – REAL (KIND=nag_wp) array   *Workspace*

Note: the dimension of the array WORK must be at least max(1, N) if NORM = '1', 'O' or 'I', and at least 1 otherwise.

6   Error Indicators and Warnings

None.

7   Accuracy

Not applicable.

8   Further Comments

None.

9   Example

None.

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