NAG Fortran 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

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

```
INTEGER                          N
double precision                 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:

if NORM = '1' or 'O', the 1-norm;
if NORM = 'I', the ∞-norm (= the 1-norm for a symmetric matrix);
if NORM = 'F' or 'E', the Frobenius (or Euclidean) norm;
if 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 as follows:

if UPLO = 'U', the upper triangular part of A is stored;
if 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.

Constraint: $\mathrm{N} \geq 0$.

4: AP$(*)$ – ***double precision*** array *Input*

Note: the dimension of the array AP must be at least $\max(1, \mathrm{N} \times (\mathrm{N}+1)/2)$.

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 $\mathrm{AP}(i+j(j-1)/2)$ for $i \leq j$;

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

5: WORK$(*)$ – ***double precision*** array *Workspace*

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

6 Error Indicators and Warnings

None.