

NAG Fortran Library Routine Document

F06RJF

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

F06RJF 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 m by n trapezoidal matrix (triangular if $m = n$).

2 Specification

double precision FUNCTION F06RJF (NORM, UPLO, DIAG, M, N, A, LDA, WORK)

INTEGER

M, N, LDA

double precision

A(LDA,*), WORK(*)

CHARACTER*1

NORM, UPLO, DIAG

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;
- if NORM = 'F' or 'E', the Frobenius (or Euclidean) norm;
- if NORM = 'M', the value $\max_{i,j} |a_{ij}|$ (not a norm).

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

2: UPLO – CHARACTER*1

Input

On entry: specifies whether A is upper or lower trapezoidal as follows:

- if UPLO = 'U', A is upper trapezoidal;
- if UPLO = 'L', A is lower trapezoidal.

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

3: DIAG – CHARACTER*1

Input

On entry: specifies whether A has non-unit or unit diagonal elements, as follows:

- if DIAG = 'N', the diagonal elements are stored explicitly;
- if DIAG = 'U', the diagonal elements are assumed to be 1, and are not referenced.

Constraint: DIAG = 'N' or 'U'.

- 4: M – INTEGER *Input*
On entry: m , the number of rows of the matrix A .
Constraint: $M \geq 0$.
- 5: N – INTEGER *Input*
On entry: n , the number of columns of the matrix A .
Constraint: $N \geq 0$.
- 6: A(LDA,*) – **double precision** array *Input*
Note: the second dimension of the array A must be at least $\max(1, N)$.
On entry: the m by n trapezoidal matrix A . If UPLO = 'U', A is upper trapezoidal and the elements of the array below the diagonal are not referenced; if UPLO = 'L', A is lower trapezoidal and the elements of the array above the diagonal are not referenced. If DIAG = 'U', the diagonal elements of A are assumed to be 1, and are not referenced.
- 7: LDA – INTEGER *Input*
On entry: the first dimension of the array A as declared in the (sub)program from which F06RJF is called.
Constraint: $LDA \geq \max(1, M)$.
- 8: WORK(*) – **double precision** array *Workspace*
Note: the dimension of the array WORK must be at least $\max(1, M)$ if NORM = 'I' and at least 1 otherwise.

6 Error Indicators and Warnings

None.
