

NAG Fortran Library Routine Document

F06REF

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

F06REF 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 band matrix.

2 Specification

double precision FUNCTION F06REF (NORM, UPLO, N, K, AB, LDAB, WORK)

INTEGER

N, K, LDAB

double precision

AB(LDAB,*), 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 $\max_{i,j} |a_{ij}|$ (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: $N \geq 0$.

4: K – INTEGER

Input

On entry: k , the number of sub-diagonals or super-diagonals of the matrix A .

Constraint: $K \geq 0$.

5: AB(LDAB,*) – *double precision* array *Input*

Note: the second dimension of the array AB must be at least $\max(1, N)$.

On entry: the n by n symmetric band matrix A , stored in rows 1 to $k + 1$. More precisely, if UPLO = 'U', the elements of the upper triangle of A within the band must be stored with element a_{ij} in $AB(k + 1 + i - j, j)$ for $\max(1, j - k) \leq i \leq j$; if UPLO = 'L', the elements of the lower triangle of A within the band must be stored with element a_{ij} in $AB(1 + i - j, j)$ for $j \leq i \leq \min(n, j + k)$.

6: LDAB – INTEGER *Input*

On entry: the first dimension of the array AB as declared in the (sub)program from which F06REF is called.

Constraint: $LDAB \geq K + 1$.

7: WORK(*) – *double precision* 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.
