NAG Fortran Library Routine Document

F06RBF

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

F06RBF 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 band matrix.

2 Specification

double precision `FUNCTION F06RBF (NORM, N, KL, KU, AB, LDAB, WORK)`

```
INTEGER                          N, KL, KU, LDAB
double precision                 AB(LDAB,*), WORK(*)
CHARACTER*1                      NORM
```

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 $\max_{i,j}\left|a_{ij}\right|$ (not a norm).

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

2: N – INTEGER *Input*

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

Constraint: N $\geq$ 0.

3: KL – INTEGER *Input*

On entry: k_l, the number of sub-diagonals within the band of A.

Constraint: KL $\geq$ 0.

4: KU – INTEGER *Input*

On entry: k_u, the number of super-diagonals within the band of A.

Constraint: KU $\geq$ 0.

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

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

On entry: the n by n band matrix A, stored in rows 1 to $k_l + k_u + 1$. More precisely, a_{ij} must be stored in $\mathrm{AB}(k_u + i - j + 1, j)$ for $\max(j - k_u, 1) \leq i \leq \min(j + k_l, n)$.

6: LDAB – INTEGER *Input*

On entry: the first dimension of the array AB as declared in the (sub)program from which F06RBF is called.

Constraint: $\mathrm{LDAB} \geq \mathrm{KL} + \mathrm{KU} + 1$.

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

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

6 Error Indicators and Warnings

None.