

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
<i>On entry:</i> 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).
<i>Constraint:</i> NORM = '1', 'O', 'I', 'F', 'E' or 'M'. | <i>Input</i> |
| 2: | N – INTEGER
<i>On entry:</i> n , the order of the matrix A .
<i>Constraint:</i> $N \geq 0$. | <i>Input</i> |
| 3: | KL – INTEGER
<i>On entry:</i> k_l , the number of sub-diagonals within the band of A .
<i>Constraint:</i> $KL \geq 0$. | <i>Input</i> |
| 4: | KU – INTEGER
<i>On entry:</i> k_u , the number of super-diagonals within the band of A .
<i>Constraint:</i> $KU \geq 0$. | <i>Input</i> |

- 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 band matrix A , stored in rows 1 to $k_l + k_u + 1$. More precisely, a_{ij} must be stored in $AB(k_u + i - j + 1, j)$ 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: $LDAB \geq KL + KU + 1$.
- 7: WORK(*) – *double precision* array *Workspace*
Note: the dimension of the array WORK must be at least $\max(1, N)$ if NORM = 'I' and at least 1 otherwise.

6 Error Indicators and Warnings

None.
