

NAG 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

```
FUNCTION F06RBF (NORM, N, KL, KU, AB, LDAB, WORK)
REAL (KIND=nag_wp) F06RBF
INTEGER           N, KL, KU, LDAB
REAL (KIND=nag_wp) AB(LDAB,*), WORK(*)
CHARACTER(1)     NORM
```

3 Description

None.

4 References

None.

5 Arguments

- 1: NORM – CHARACTER(1) *Input*
On entry: specifies the value to be returned.
 NORM = '1' or 'O'
 The 1-norm.
 NORM = 'I'
 The ∞ -norm.
 NORM = 'F' or 'E'
 The Frobenius (or Euclidean) norm.
 NORM = 'M'
 The value $\max_{i,j} |a_{ij}|$ (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 .
 When $N = 0$, F06RBF returns zero.
Constraint: $N \geq 0$.
- 3: KL – INTEGER *Input*
On entry: k_l , the number of subdiagonals within the band of A .
Constraint: $KL \geq 0$.

- 4: KU – INTEGER *Input*
On entry: k_u , the number of superdiagonals within the band of A .
Constraint: $KU \geq 0$.
- 5: AB(LDAB,*) – REAL (KIND=nag_wp) array *Input*
Note: the second dimension of the array AB must be at least N.
On entry: the n by n band matrix A .
 The matrix is stored in rows 1 to $k_l + k_u + 1$, more precisely, the element A_{ij} must be stored in

$$AB(k_u + 1 + i - j, j) \quad \text{for } \max(1, j - k_u) \leq i \leq \min(n, j + k_l).$$
- 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(*) – REAL (KIND=nag_wp) 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.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06RBF is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
