

# NAG Fortran Library Routine Document

## F06UBF

**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

F06UBF returns, via the function name, the value of the 1-norm, the  $\infty$ -norm, the Frobenius norm, or the maximum absolute value of the elements of a complex  $n$  by  $n$  band matrix.

### 2 Specification

```

double precision FUNCTION F06UBF (NORM, N, KL, KU, AB, LDAB, WORK)
INTEGER                                N, KL, KU, LDAB
double precision                    WORK(*)
complex*16                          AB(LDAB,*)
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  $\infty$ -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: 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,\*) – **complex\*16** 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 F06UBF 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.

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