NAG Fortran Library Routine Document

F06UKF

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

F06UKF 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 complex n by n triangular matrix, stored in packed form.

2 Specification

double precision `FUNCTION F06UKF (NORM, UPLO, DIAG, N, AP, WORK)`

```
INTEGER                          N
double precision                 WORK(*)
complex*16                       AP(*)
CHARACTER*1                      NORM, UPLO, DIAG
```

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

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

2: UPLO – CHARACTER*1 *Input*

On entry: specifies whether A is upper or lower triangular as follows:

if UPLO = 'U', A is upper triangular;
if UPLO = 'L', A is lower triangular.

Constraint: UPLO = 'U' or 'L'.

3: DIAG – CHARACTER*1 *Input*

On entry: specifies whether A has non-unit or unit diagonal elements, as follows:

if DIAG = 'N', the diagonal elements are stored explicitly;
if DIAG = 'U', the diagonal elements are assumed to be 1, and are not referenced.

Constraint: DIAG = 'N' or 'U'.

4: N – INTEGER *Input*

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

Constraint: $\mathrm{N} \geq 0$.

5: AP$(*)$ – ***complex*16*** array *Input*

Note: the dimension of the array AP must be at least $\max(1, \mathrm{N} \times (\mathrm{N}+1)/2)$.

On entry: the n by n triangular matrix A, packed by columns. More precisely, if UPLO $=$ 'U', the upper triangle of A must be stored with element a_{ij} in $\mathrm{AP}(i+j(j-1)/2)$ for $i \leq j$; if UPLO $=$ 'L', the lower triangle of A must be stored with element a_{ij} in $\mathrm{AP}(i+(2n-j)(j-1)/2)$ for $i \geq j$. If DIAG $=$ 'U', the diagonal elements of A are assumed to be 1, and are not referenced; the same storage scheme is used whether DIAG $=$ 'N' or 'U'.

6: 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.