

NAG Library Routine Document

F06UCF

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

F06UCF 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 Hermitian matrix.

2 Specification

```
FUNCTION F06UCF (NORM, UPLO, N, A, LDA, WORK)
REAL (KIND=nag_wp) F06UCF
INTEGER                N, LDA
REAL (KIND=nag_wp)     WORK(*)
COMPLEX (KIND=nag_wp)  A(LDA,*)
CHARACTER(1)           NORM, UPLO
```

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 (= the 1-norm for a Hermitian matrix).
 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: UPLO – CHARACTER(1) *Input*
On entry: specifies whether the upper or lower triangular part of A is stored.
 UPLO = 'U'
 The upper triangular part of A is stored.
 UPLO = 'L'
 The lower triangular part of A is stored.
Constraint: UPLO = 'U' or 'L'.

- 3: N – INTEGER *Input*
On entry: n , the order of the matrix A .
 When $N = 0$, F06UCF returns zero.
Constraint: $N \geq 0$.
- 4: A(LDA,*) – COMPLEX (KIND=nag_wp) array *Input*
Note: the second dimension of the array A must be at least $\max(1, N)$.
On entry: the n by n Hermitian matrix A .
 If UPLO = 'U', the upper triangular part of A must be stored and the elements of the array below the diagonal are not referenced.
 If UPLO = 'L', the lower triangular part of A must be stored and the elements of the array above the diagonal are not referenced.
- 5: LDA – INTEGER *Input*
On entry: the first dimension of the array A as declared in the (sub)program from which F06UCF is called.
Constraint: $LDA \geq \max(1, N)$.
- 6: WORK(*) – REAL (KIND=nag_wp) array *Workspace*
Note: the dimension of the array WORK must be at least $\max(1, N)$ if NORM = '1', 'O' or 'I', and at least 1 otherwise.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06UCF is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
