

# NAG Fortran 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  $\infty$ -norm, the Frobenius norm, or the maximum absolute value of the elements of a complex  $n$  by  $n$  Hermitian matrix.

### 2 Specification

```

double precision FUNCTION F06UCF (NORM, UPLO, N, A, LDA, WORK)
INTEGER                                N, LDA
double precision                    WORK(*)
complex*16                          A(LDA,*)
CHARACTER*1                            NORM, UPLO

```

### 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 (= the 1-norm for a Hermitian matrix);  
 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 the upper or lower triangular part of  $A$  is stored as follows:  
 if UPLO = 'U', the upper triangular part of  $A$  is stored;  
 if 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  $A$ .  
*Constraint:*  $N \geq 0$ .

- 4: A(LDA,\*) – **complex\*16** 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 triangle of  $A$  must be stored and the elements of the array below the diagonal are not referenced; if UPLO = 'L', the lower triangle 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(\*) – **double precision** 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.

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