

# NAG Fortran Library Routine Document

## F06UDF

**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

F06UDF 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, stored in packed form.

### 2 Specification

```

double precision FUNCTION F06UDF (NORM, UPLO, N, AP, WORK)
  INTEGER                                N
  double precision                    WORK(*)
  complex*16                          AP(*)
  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: AP(\*) – **complex\*16** array *Input*

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

*On entry:* the  $n$  by  $n$  Hermitian matrix  $A$ , packed by columns. More precisely, if UPLO = 'U', the upper triangle of  $A$  must be stored with element  $a_{ij}$  in  $AP(i + j(j - 1)/2)$  for  $i \leq j$ ; if UPLO = 'L', the lower triangle of  $A$  must be stored with element  $a_{ij}$  in  $AP(i + (2n - j)(j - 1)/2)$  for  $i \geq j$ .

5: 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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