

NAG 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 ∞ -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

```
FUNCTION F06UDF (NORM, UPLO, N, AP, WORK)
REAL (KIND=nag_wp) F06UDF
INTEGER                N
REAL (KIND=nag_wp)    WORK(*)
COMPLEX (KIND=nag_wp) AP(*)
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 $N = 0$, F06UDF returns zero.
Constraint: $N \geq 0$.
- 4: AP(*) – COMPLEX (KIND=nag_wp) array *Input*
Note: the dimension of the array AP must be at least $N \times (N + 1)/2$.
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(*) – 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

F06UDF is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
