NAG Library Routine Document

F06UFF

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

F06UFF 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 symmetric matrix.

2 Specification

```
FUNCTION F06UFF (NORM, UPLO, N, A, LDA, WORK)
REAL (KIND=nag_wp) F06UFF

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 symmetric 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, F06UFF 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 symmetric 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 F06UFF 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

F06UFF is not threaded in any implementation.

9   Further Comments

None.

10   Example

None.