NAG Library Routine Document

F06PCF (DSYMV)

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

F06PCF (DSYMV) performs the matrix-vector operation

$$y \leftarrow \alpha Ax + \beta y,$$

where A is an n by n real symmetric matrix, x and y are n element real vectors, and α and β are real scalars.

2 Specification

```
SUBROUTINE F06PCF(UPLO, N, ALPHA, A, LDA, X, INCX, BETA, Y, INCY)
INTEGER            N, LDA, INCX, INCY
double precision   ALPHA, A(LDA,*), X(*), BETA, Y(*)
CHARACTER*1        UPLO
```

The routine may be called by its BLAS name ***dsymv***.

3 Description

None.

4 References

None.

5 Parameters

1: 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'.

2: N – INTEGER *Input*

On entry: n, the order of the matrix A.

Constraint: N ≥ 0.

3: ALPHA – ***double precision*** *Input*

On entry: the scalar α.

4: A(LDA,$*$) – ***double precision*** 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 F06PCF (DSYMV) is called.

Constraint: LDA $\geq \max(1, \mathrm{N})$.

6: X$(*)$ – ***double precision*** array *Input*

Note: the dimension of the array X must be at least $1 + (\mathrm{N} - 1)|\mathrm{INCX}|$.

On entry: the incremented array X must contain the n element vector x.

7: INCX – INTEGER *Input*

On entry: the increment in the subscripts of X between successive elements of x.

Constraint: INCX $\neq 0$.

8: BETA – ***double precision*** *Input*

On entry: the scalar β.

9: Y$(*)$ – ***double precision*** array *Input/Output*

Note: the dimension of the array Y must be at least $1 + (\mathrm{N} - 1)|\mathrm{INCY}|$.

On entry: the incremented array Y must contain the n element vector y.

On exit: the updated vector y.

10: INCY – INTEGER *Input*

On entry: the increment in the subscripts of Y between successive elements of y.

Constraint: INCY $\neq 0$.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.