

NAG Library Routine Document

F06FCF

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

F06FCF multiplies a real vector by a real diagonal matrix.

2 Specification

```
SUBROUTINE F06FCF(N, D, INCX, X, INCX)
INTEGER          N, INCX, INCX
double precision D(*), X(*)
```

3 Description

F06FCF performs the operation

$$x \leftarrow Dx$$

where x is an n element real vector and $D = \text{diag}(d)$ is a real diagonal matrix.

Equivalently, the routine performs the element-by-element product of the vectors x and d

$$x_i = d_i x_i, \quad i = 1, 2, \dots, n.$$

4 References

None.

5 Parameters

- | | | |
|----|--|---------------------|
| 1: | N – INTEGER
<i>On entry:</i> n , the number of elements in d and x . | <i>Input</i> |
| 2: | D(*) – <i>double precision</i> array
Note: the dimension of the array D must be at least $\max(1, 1 + (N - 1) \text{INCX})$.
<i>On entry:</i> the vector d . | <i>Input</i> |
| 3: | INCX – INTEGER
<i>On entry:</i> the increment in the subscripts of D between successive elements of d . | <i>Input</i> |
| 4: | X(*) – <i>double precision</i> array
Note: the dimension of the array X must be at least $1 + (N - 1) \text{INCX} $.
<i>On entry:</i> the incremented array X must contain the n element vector x .
<i>On exit:</i> the updated vector x . | <i>Input/Output</i> |
| 5: | INCX – INTEGER
<i>On entry:</i> the increment in the subscripts of X between successive elements of x . | <i>Input</i> |

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.
