

NAG Library Routine Document

F06FKF

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

F06FKF computes the weighted Euclidean norm of a real vector.

2 Specification

```
FUNCTION F06FKF (N, W, INCW, X, INCX)
REAL (KIND=nag_wp) F06FKF
INTEGER          N, INCW, INCX
REAL (KIND=nag_wp) W(*), X(*)
```

3 Description

F06FKF returns, via the function name, the weighted Euclidean norm

$$\sqrt{x^T W x}$$

of the n -element real vector x scattered with stride INCW and INCX respectively, where $W = \text{diag}(w)$ and w is a vector of weights scattered with stride INCW.

4 References

None.

5 Parameters

- 1: N – INTEGER *Input*
On entry: n , the number of elements in x .
- 2: W(*) – REAL (KIND=nag_wp) array *Input*
Note: the dimension of the array W must be at least $\max(1, 1 + (N - 1) \times |\text{INCW}|)$.
On entry: w , the vector of weights.
 If $\text{INCW} > 0$, w_i must be stored in $W(1 + (i - 1) \times \text{INCW})$, for $i = 1, 2, \dots, N$.
 If $\text{INCW} < 0$, w_i must be stored in $W(1 - (N - i) \times \text{INCW})$, for $i = 1, 2, \dots, N$.
Constraint: All weights must be non-negative.
- 3: INCW – INTEGER *Input*
On entry: the increment in the subscripts of W between successive elements of w .
- 4: X(*) – REAL (KIND=nag_wp) array *Input*
Note: the dimension of the array X must be at least $\max(1, 1 + (N - 1) \times |\text{INCX}|)$.
On entry: the n -element vector x .
 If $\text{INCX} > 0$, x_i must be stored in $X(1 + (i - 1) \times \text{INCX})$, for $i = 1, 2, \dots, N$.
 If $\text{INCX} < 0$, x_i must be stored in $X(1 - (N - i) \times \text{INCX})$, for $i = 1, 2, \dots, N$.

Intermediate elements of X are not referenced.

5: INCX – INTEGER

Input

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

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

Not applicable.

9 Further Comments

None.

10 Example

None.
