

NAG Library Routine Document

F06FTF

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

F06FTF applies a NAG (as opposed to LINPACK) style real elementary reflection to a real vector.

2 Specification

```
SUBROUTINE F06FTF (N, DELTA, Y, INCY, ZETA, Z, INCZ)
```

```
INTEGER          N, INCY, INCZ
REAL (KIND=nag_wp) DELTA, Y(*), ZETA, Z(*)
```

3 Description

F06FTF applies a real elementary reflection (Householder matrix) P , as generated by F06FRF, to a given real vector:

$$\begin{pmatrix} \delta \\ y \end{pmatrix} \leftarrow P \begin{pmatrix} \delta \\ y \end{pmatrix},$$

where y is an n -element real vector and δ a real scalar.

4 References

None.

5 Parameters

- | | | |
|----|---|---------------------|
| 1: | N – INTEGER | <i>Input</i> |
| | <i>On entry:</i> n , the number of elements in y and z . | |
| 2: | DELTA – REAL (KIND=nag_wp) | <i>Input/Output</i> |
| | <i>On entry:</i> the original scalar δ . | |
| | <i>On exit:</i> the transformed scalar δ . | |
| 3: | Y(*) – REAL (KIND=nag_wp) array | <i>Input/Output</i> |
| | Note: the dimension of the array Y must be at least $\max(1, 1 + (N - 1) \times \text{INCY})$. | |
| | <i>On entry:</i> the original vector y . | |
| | If $\text{INCY} > 0$, y_i must be stored in $Y(1 + (i - 1) \times \text{INCY})$, for $i = 1, 2, \dots, N$. | |
| | If $\text{INCY} < 0$, y_i must be stored in $Y(1 - (N - i) \times \text{INCY})$, for $i = 1, 2, \dots, N$. | |
| | <i>On exit:</i> the transformed stored in the same array elements used to supply the original vector y . | |
| 4: | INCY – INTEGER | <i>Input</i> |
| | <i>On entry:</i> the increment in the subscripts of Y between successive elements of y . | |

- 5: ZETA – REAL (KIND=nag_wp) *Input*
On entry: the scalar ζ , as returned by F06FRF.
 If $\zeta = 0$, P is assumed to be the unit matrix and the transformation is skipped.
Constraint: if ZETA = 0.0, N = 0.
- 6: Z(*) – REAL (KIND=nag_wp) array *Input*
Note: the dimension of the array Z must be at least $\max(1, 1 + (N - 1) \times |\text{INCZ}|)$.
On entry: the vector z , as returned by F06FRF.
 If $\text{INCZ} > 0$, z_i must be stored in $Z(1 + (i - 1) \times \text{INCZ})$, for $i = 1, 2, \dots, N$.
 If $\text{INCZ} < 0$, z_i must be stored in $Z(1 - (N - i) \times \text{INCZ})$, for $i = 1, 2, \dots, N$.
- 7: INCZ – INTEGER *Input*
On entry: the increment in the subscripts of Z between successive elements of z .

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

None.
