

NAG Library Routine Document

F06EPF (DROT)

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

F06EPF (DROT) applies a real plane rotation to two real vectors.

2 Specification

```
SUBROUTINE F06EPF (N, X, INCX, Y, INCY, C, S)
  INTEGER          N, INCX, INCY
  REAL (KIND=nag_wp) X(*), Y(*), C, S
```

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

3 Description

F06EPF (DROT) applies a real plane rotation to two n -element real vectors x and y :

$$\begin{pmatrix} x^T \\ y^T \end{pmatrix} \leftarrow \begin{pmatrix} c & s \\ -s & c \end{pmatrix} \begin{pmatrix} x^T \\ y^T \end{pmatrix}.$$

with stride INCX and INCY respectively. The plane rotation has the form generated by F06AAF (DROTG) or F06BAF.

4 References

Lawson C L, Hanson R J, Kincaid D R and Krogh F T (1979) Basic linear algebra subprograms for Fortran usage *ACM Trans. Math. Software* **5** 308–325

5 Arguments

- 1: N – INTEGER *Input*
On entry: n , the number of elements in x and y .
- 2: X(*) – REAL (KIND=nag_wp) array *Input/Output*
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.
On exit: the transformed vector x stored in the array elements used to supply the original vector x .
 Intermediate elements of X are unchanged.
- 3: INCX – INTEGER *Input*
On entry: the increment in the subscripts of X between successive elements of x .

4: Y(*) – REAL (KIND=nag_wp) array *Input/Output*

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

On entry: the n -element 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 $i = 1, 2, \dots, N$.

Intermediate elements of Y are not referenced.

On exit: the transformed vector y stored in the array elements used to supply the original vector y .

Intermediate elements of Y are unchanged.

5: INCY – INTEGER *Input*

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

6: C – REAL (KIND=nag_wp) *Input*

On entry: the value c , the cosine of the rotation.

7: S – REAL (KIND=nag_wp) *Input*

On entry: the value s , the sine of the rotation.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Parallelism and Performance

F06EPF (DROT) is not threaded in any implementation.

9 Further Comments

None.

10 Example

None.
