

NAG Fortran Library Routine Document

F06BAF

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

F06BAF generates a real Givens plane rotation with parameters $c (\geq 0)$ and s , such that, given real a and b :

$$\begin{pmatrix} c & s \\ -s & c \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} d \\ 0 \end{pmatrix}.$$

On exit, b is overwritten by t , the tangent of the rotation; c and s can be reconstructed from the single stored value t , by a subsequent call to F06BCF.

If $|b| < \sqrt{\epsilon}|a|$, where ϵ is the *machine precision*, the routine sets $c = 1$ and $s = 0$; if $|a| < \sqrt{\epsilon}|b|$, the routine sets $c = 0$ and $s = \text{sign } b/a$.

Note that t is always set to b/a , unless this would overflow, in which case the value $flmax \times \text{sign } b/a$ is returned, where $flmax$ is the value given by 1/(X02AMF).

To apply the plane rotation to a pair of real vectors, call F06EPF (DROT); to apply it to a pair of complex vectors, call F06KPF.

2 Specification

SUBROUTINE F06BAF (A, B, C, S)
double precision A, B, C, S

3 Description

None.

4 References

None.

5 Parameters

- | | | |
|----|---|---------------------|
| 1: | <i>A</i> – <i>double precision</i>
<i>On entry:</i> the value a , the 1st element of the vector which determines the rotation.
<i>On exit:</i> the value d . | <i>Input/Output</i> |
| 2: | <i>B</i> – <i>double precision</i>
<i>On entry:</i> the value b , the 2nd element of the vector which determines the rotation.
<i>On exit:</i> the value t , the tangent of the rotation. | <i>Input/Output</i> |
| 3: | <i>C</i> – <i>double precision</i>
<i>On exit:</i> the value c , the cosine of the rotation. | <i>Output</i> |
| 4: | <i>S</i> – <i>double precision</i>
<i>On exit:</i> the value s , the sine of the rotation. | <i>Output</i> |

6 Error Indicators and Warnings

None.
