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 (≥ 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 $s = \operatorname{sign} b/a$.

Note that t is always set to b/a, unless this would overflow, in which case the value $flmax \times \operatorname{sign} b/a$ 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: A – ***double precision*** *Input/Output*

On entry: the value a, the 1st element of the vector which determines the rotation.

On exit: the value d.

2: B – ***double precision*** *Input/Output*

On entry: the value b, the 2nd element of the vector which determines the rotation.

On exit: the value t, the tangent of the rotation.

3: C – ***double precision*** *Output*

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

4: S – ***double precision*** *Output*

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

6 Error Indicators and Warnings

None.