

# NAG Library Routine Document

## F06BEF

**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

F06BEF generates a real Jacobi plane rotation.

### 2 Specification

```
SUBROUTINE F06BEF (JOB, X, Y, Z, C, S)
REAL (KIND=nag_wp) X, Y, Z, C, S
CHARACTER(1)      JOB
```

### 3 Description

F06BEF generates a real Jacobi plane rotation with parameters  $c$  and  $s$ , which diagonalizes a given 2 by 2 real symmetric matrix:

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

### 4 References

None.

### 5 Parameters

- |    |  |                     |
|----|--|---------------------|
| 1: | JOB – CHARACTER(1)   | <i>Input</i>        |
|    | <i>On entry:</i> specifies the property which determines the precise form of the rotation. |                     |
|    | JOB = 'B'<br>$c \geq 1/\sqrt{2}$ .   |                     |
|    | JOB = 'S'<br>$0 \leq c \leq 1/\sqrt{2}$ .  |                     |
|    | JOB = 'M'<br>$ a  \geq  b $ .  |                     |
|    | <i>Constraint:</i> JOB = 'B', 'S' or 'M'.  |                     |
| 2: | X – REAL (KIND=nag_wp)   | <i>Input/Output</i> |
|    | <i>On entry:</i> the value $x$ , the (1,1) element of the input matrix.                    |                     |
|    | <i>On exit:</i> the value $a$ .  |                     |
| 3: | Y – REAL (KIND=nag_wp)   | <i>Input/Output</i> |
|    | <i>On entry:</i> the value $y$ , the (1,2) or (2,1) element of the input matrix.           |                     |
|    | <i>On exit:</i> the value $t$ , the tangent of the rotation.                               |                     |
| 4: | Z – REAL (KIND=nag_wp)   | <i>Input/Output</i> |
|    | <i>On entry:</i> the value $z$ , the (2,2) element of the input matrix.                    |                     |

*On exit:* the value  $b$ .

5: C – REAL (KIND=nag\_wp)

*Output*

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

6: S – REAL (KIND=nag\_wp)

*Output*

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

## 6 Error Indicators and Warnings

None.

## 7 Accuracy

Not applicable.

## 8 Parallelism and Performance

Not applicable.

## 9 Further Comments

None.

## 10 Example

None.

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