

# NAG Library Routine Document

## F06BHF

**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

F06BHF applies a real similarity rotation to a 2 by 2 real symmetric matrix.

### 2 Specification

```
SUBROUTINE F06BHF (X, Y, Z, C, S)
```

```
REAL (KIND=nag_wp) X, Y, Z, C, S
```

### 3 Description

F06BHF applies a real similarity rotation, with parameters  $c$  and  $s$ , to a given 2 by 2 real symmetric matrix; that is, it performs the operation:

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

### 4 References

None.

### 5 Parameters

- |    |   |                     |
|----|---|---------------------|
| 1: | X – REAL (KIND=nag_wp)<br><i>On entry:</i> the value $x$ , the (1,1) element of the input matrix.<br><i>On exit:</i> the transformed value $x$ .          | <i>Input/Output</i> |
| 2: | Y – REAL (KIND=nag_wp)<br><i>On entry:</i> the value $y$ , the (1,2) or (2,1) element of the input matrix.<br><i>On exit:</i> the transformed value $y$ . | <i>Input/Output</i> |
| 3: | Z – REAL (KIND=nag_wp)<br><i>On entry:</i> the value $z$ , the (2,2) element of the input matrix.<br><i>On exit:</i> the transformed value $z$ .          | <i>Input/Output</i> |
| 4: | C – REAL (KIND=nag_wp)<br><i>On entry:</i> the value $c$ , the cosine of the rotation.  | <i>Input</i>        |
| 5: | S – REAL (KIND=nag_wp)<br><i>On entry:</i> the value $s$ , the sine of the rotation.  | <i>Input</i>        |

### 6 Error Indicators and Warnings

None.

**7 Accuracy**

Not applicable.

**8 Further Comments**

None.

**9 Example**

None.

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