

# NAG Library Routine Document

## F06BCF

**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

F06BCF reconstructs the parameters  $c$  and  $s$  of a real plane rotation from the tangent of that rotation.

### 2 Specification

```
SUBROUTINE F06BCF ( T, C, S )
```

```
REAL (KIND=nag_wp) T, C, S
```

### 3 Description

F06BCF reconstructs the parameters  $c$  and  $s$  of a real plane rotation from the value of the tangent  $t$ , as returned by F06BAF:

$$c = \frac{1}{\sqrt{1+t^2}}, \quad s = ct,$$

so that  $c \geq 0$  and  $s$  has the same sign as  $t$ .

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

### 4 References

None.

### 5 Parameters

- |    |   |               |
|----|---|---------------|
| 1: | T – REAL (KIND=nag_wp)  | <i>Input</i>  |
|    | <i>On entry:</i> the value $t$ , the tangent of the rotation. |               |
| 2: | C – REAL (KIND=nag_wp)  | <i>Output</i> |
|    | <i>On exit:</i> the value $c$ , the cosine of the rotation.   |               |
| 3: | S – REAL (KIND=nag_wp)  | <i>Output</i> |
|    | <i>On exit:</i> the value $s$ , the sine of the rotation.     |               |

### 6 Error Indicators and Warnings

None.

### 7 Accuracy

Not applicable.

## **8 Further Comments**

None.

## **9 Example**

None.

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