

# NAG Fortran 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 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  $s = \text{sign } t$ .

### 2 Specification

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

### 3 Description

None.

### 4 References

None.

### 5 Parameters

- |    |  |               |
|----|--|---------------|
| 1: | $T$ – <i>double precision</i><br><i>On entry:</i> the value $t$ , the tangent of the rotation. | <i>Input</i>  |
| 2: | $C$ – <i>double precision</i><br><i>On exit:</i> the value $c$ , the cosine of the rotation.   | <i>Output</i> |
| 3: | $S$ – <i>double precision</i><br><i>On exit:</i> the value $s$ , the sine of the rotation.     | <i>Output</i> |

### 6 Error Indicators and Warnings

None.