

NAG Fortran Library Routine Document

F06BPF

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

F06BPF returns an eigenvalue of the 2 by 2 real symmetric matrix

$$\begin{pmatrix} a & b \\ b & c \end{pmatrix},$$

via the function name. The result is intended for use as a shift in symmetric eigenvalue routines.

The eigenvalue is computed as

$$c - \frac{b}{f + \text{sign } f \times \sqrt{1 + f^2}}, \quad \text{where } f = \frac{a - c}{2b}.$$

This is the eigenvalue nearer to c if $a \neq c$, and is equal to $c - b$ if $a = c$.

2 Specification

double precision FUNCTION F06BPF (A, B, C)
double precision A, B, C

3 Description

None.

4 References

None.

5 Parameters

- | | | |
|----|--|--------------|
| 1: | A – <i>double precision</i> | <i>Input</i> |
| | <i>On entry:</i> the value a , the (1, 1) element of the input matrix. | |
| 2: | B – <i>double precision</i> | <i>Input</i> |
| | <i>On entry:</i> the value b , the (1, 2) or (2, 1) element of the input matrix. | |
| 3: | C – <i>double precision</i> | <i>Input</i> |
| | <i>On entry:</i> the value c . the (2, 2) element of the input matrix. | |

6 Error Indicators and Warnings

None.
