1 SUMMARY

To calculate the coefficients of a polynomial given all its roots, the roots must be real, i.e. given real numbers \( \xi_1, \xi_2, \ldots, \xi_n \), calculate \( a_0, a_1, \ldots, a_n \) with \( a_n = 1 \) such that
\[
a_0 + a_1 x + a_2 x^2 + \ldots + a_n x^n = (x-\xi_1)(x-\xi_2)\ldots(x-\xi_n)
\]


2 HOW TO USE THE PACKAGE

2.1 Argument list

The single precision version

\[
\text{CALL } \text{PC01A}(\text{ROOT}, \text{COE}, N)
\]

The double precision version

\[
\text{CALL } \text{PC01AD}(\text{ROOT}, \text{COE}, N)
\]

ROOT is a REAL (DOUBLE PRECISION in the D version) array which must be set by the user to the roots \( \xi_i, i=1, 2, \ldots, n \).

COE is a REAL (DOUBLE PRECISION in the D version) array of length at least \( n+1 \) in which the subroutine will return the coefficients \( a_i, i=0, 1, 2, \ldots, n \) in the elements \( \text{COE}(J), J=1, 2, \ldots, N+1 \). Note that \( \text{COE}(N+1) \) is always set to one.

\( N \) is an INTEGER which must be set by the user to \( n \) the number of roots (also the degree of the polynomial).

3 GENERAL INFORMATION

Workspace: None.

Use of common: None.

Other routines called directly: None.

Input/output: None.

Restrictions: None.