



1 SUMMARY

Given the coefficients of a polynomial calculates the coefficients of its expansion in terms of Chebyshev polynomials, i.e. given $a_j, j=0, 1, \dots, n$ it finds $b_j, j=0, 1, \dots, n$ such that

$$b_0 T_0(x) + b_1 T_1(x) + \dots + b_n T_n(x) \equiv a_0 + a_1 x + \dots + a_n x^n \quad n \leq 40$$

ATTRIBUTES — **Version:** 1.0.0. **Types:** PE03A; PE03AD. **Original date:** September 1963. **Origin:** C.Brittian, Harwell.

2 HOW TO USE THE PACKAGE

2.1 The argument list

The single precision version

```
CALL PE03A(N,A,B)
```

The double precision version

```
CALL PE03AD(N,A,B)
```

N is an INTEGER variable which must be set by the user to n the degree of the polynomial. This argument is not altered. **Restriction:** $n \leq 40$.

A is a REAL (DOUBLE PRECISION in the D version) array which must be set by the user to contain the coefficients of the original polynomial, i.e. set $A(i+1) = a_i, i=0, 1, 2, \dots, n$. This argument is not altered.

B is a REAL (DOUBLE PRECISION in the D version) array of length at least $n+1$ in which the routine returns the coefficients of the Chebyshev expansion, i.e. it sets $B(i+1) = b_i, i=0, 1, 2, \dots, n$.

3 GENERAL INFORMATION

Workspace: None.

Use of common: None.

Other routines called directly: None.

Input/output: None.

Restrictions: $n \leq 40$.