1 SUMMARY

To **compute the value of a polynomial**

$$P(x) = a_0 + a_1 x + a_2 x^2 + ... + a_n x^n$$

The value is calculated using the nested form

$$P(x) = (...(a_n x + a_{n-1})x + ... + a_1)x + a_0$$

accumulating intermediate results double length.

ATTRIBUTES — Version: 1.0.0. **Types:** `PB01A; PB01AD.` **Original date:** August 1967. **Origin:** R.C.F.McLatchie, Harwell. **Remark:** `PB01A` was formerly called `PB01AS`.

2 HOW TO USE THE PACKAGE

2.1 The argument list

The single precision version

```
P=PB01A(A,N,X)
```

The double precision version

```
P=PB01AD(A,N,X)
```

`A` is a `REAL` (`DOUBLE PRECISION` in the D version) array which must be set by the user to contain the coefficients of the polynomial, i.e. set `A(i+1)` = a_i, i=0, 1, 2,..., n.

`N` is an `INTEGER` variable which must be set by the user to n the degree of the polynomial.

`X` is a `REAL` (`DOUBLE PRECISION` in the D version) variable which must be set by the user to the value of x for which the value of the polynomial is required.

N.B. No arguments are changed by the subroutine.

`P` The subroutine is a function subroutine which returns the value of the polynomial. The double precision version must be declared as `DOUBLE PRECISION` in the calling program if the full precision is to be obtained.

3 GENERAL INFORMATION

Use of common: None.

Workspace: None.

Other routines called directly: None.

Input/output: None.

4 METHOD

The value of the polynomial is calculated using the nested form

$$P(x) = (...((a_n x + a_{n-1})x + a_{n-2})x + ... + a_1)x + a_0$$

accumulating intermediate values in double length floating point registers.