1 SUMMARY

Given that **A** is a symmetric $n \times n$ matrix and given that **B** is the $(n-1) \times (n-1)$ matrix which is the inverse of the matrix obtained by deleting the last row and column of **A**, to replace **B** by the inverse of **A**.

ATTRIBUTES — Version: 1.0.0. **Types:** `MB05A, MB05AD.` **Original date:** May 1964. **Origin:** M.J.D. Powell, Harwell.

2 HOW TO USE THE PACKAGE

2.1 The argument list and calling sequence

The single precision version

```
CALL MB05A (A,B,N,IDIM)
```

The double precision version

```
CALL MB05AD (A,B,N,IDIM)
```

`A` is a `REAL` (`DOUBLE PRECISION` in the D version) array for the elements of the matrix **A**.

`B` is a `REAL` (`DOUBLE PRECISION` in the D version) for the elements of **B**.

`N` is an `INTEGER` giving the dimension of `A`.

`IDIM` is an `INTEGER` specifying the first dimensions of the arrays **A** and **B**, so that in the calling routine there will normally be a statement of the form

```
DIMENSION  A(IDIM, ),  B(IDIM, )
```

3 GENERAL INFORMATION

Use of common: None.

Workspace: None.

Input/output: None.

Restrictions:

$N \geq 2$

4 METHOD

The matrix **A** and the required **B** are partitioned in the following way:

$$\begin{pmatrix} \mathbf{A}_0 & \alpha \\ \alpha^T & a \end{pmatrix}. \qquad \begin{pmatrix} \mathbf{B}_0 & \beta \\ \beta^T & b \end{pmatrix}.$$

and the required parts of **B** are computed as follows: if

$$y = \mathbf{A}_0^{-1} \alpha$$

then

$$b = [a - \alpha^T y]^{-1}$$

$$\beta = -by$$

and

$$\mathbf{B}_0 = \mathbf{A}_0^{-1} - \beta y.$$