1 SUMMARY

To **delete a column from an** $n\times n$ **triangular matrix** to get $\mathbf{V}=\{v_{ij}\}_{n\times(n-1)}$ and return a related triangular matrix $\mathbf{U}=\{u_{ij}\}_{(n-1)\times(n-1)}$ such that $\mathbf{U}^T\mathbf{U}=\mathbf{V}^T\mathbf{V}$.

Both the original matrix and **U** are stored in a compact form.

ATTRIBUTES — Version: 1.0.0. **Remark:** the matrix storage format is that of `MC11`. **Types:** `MC17A, MC17AD`. **Calls:** `MC11`. **Original date:** September 1974. **Origin:** M.J.D.Powell, Harwell.

2 HOW TO USE THE PACKAGE

2.1 The argument list

The single precision version

```
CALL MC17A(A,N,I,W)
```

The double precision version

```
CALL MC17AD(A,N,I,W)
```

`A` is a `REAL` (`DOUBLE PRECISION` in the D version) array of length at least $n(n+1)/2$, whose elements must be set by the user to the elements of **U**. It is convenient to use the notation d_1, $l_{2,1}$, $l_{3,1}$,..., $l_{n,1}$, d_2, $l_{3,2}$,..., $l_{n,2}$,..., d_n for these elements, to let **D** be the diagonal matrix whose diagonal elements are d_1, d_2,..., d_n, and to let **L** be the lower triangular matrix with ones on the diagonal whose other non-zero elements are $l_{i,j}$ ($i>j$). Then **D** and **L** are related to **U** by the equation $\mathbf{U}^T\mathbf{U}=\mathbf{L}\mathbf{D}\mathbf{L}^T$. On exit from the subroutine the first $n(n-1)/2$ elements of A represent the required upper triangular matrix, in the **D**–**L** form that is used for input.

`N` is an `INTEGER` variable which must be set by the user to a positive integer that is the dimension of **U**. The subroutine decreases its value by one to the dimension of the new matrix, unless the chosen column number i fails to satisfy the condition $1\leq i\leq n$.

`I` is an `INTEGER` variable which must be set by the user to i the number of the column to be removed from the original matrix. It is unchanged by the subroutine.

`W` is a `REAL` (`DOUBLE PRECISION` in the D version) array whose first (n-1) components are used for working space.

3 GENERAL INFORMATION

Workspace: The total amount of work is bounded by a multiple of n^2, and depends on the position of the selected column i, there being less calculation when i is closer to n.

Use of common: None.

Other routines called directly: `MC11A/AD`.

Input/output: None.

Restrictions: There is no upper bound on the value of n.