## Manipulation — Matrix manipulation

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### Contents

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#### Transposition

- **transposeonly()**
  - **_transposeonly()**
  - transposition without conjugation

- **transpose()**
  - **_transpose()**
  - transposition in place

#### Diagonals

- **diag()**
  - **_diag()**
  - create diagonal matrix from vector

- **_diag()**
  - replace diagonal of matrix

- **diagonal()**
  - **_diagonal()**
  - extract diagonal of matrix into vector

#### Triangular & symmetric

- **lowertriangle()**
  - **_lowertriangle()**
  - extract lower triangle

- **uppertriangle()**
  - extract upper triangle

- **sublowertriangle()**
  - **_sublowertriangle()**
  - generalized lowertriangle()

- **makesymmetric()**
  - **_makesymmetric()**
  - make matrix symmetric (Hermitian)

#### Sorting

- **sort()**
  - **_sort()**
  - sort rows of matrix

- **jumble()**
  - randomize order of rows of matrix

- **order()**
  - permutation vector for ordered rows

- **unorder()**
  - permutation vector for randomized rows

- **_collate()**
  - order matrix on permutation vector

- **uniqrows()**
  - **_uniqrows()**
  - sorted, unique rows
Editing

`fillmissing()` change matrix to contain missing values

`editmissing()` replace missing values in matrix

`editvalue()` replace values in matrix

`edittozero()` edit matrix for roundoff error (zeros)

`edittozerotol()` same, absolute tolerance

`edittoint()` edit matrix for roundoff error (integers)

`edittointtol()` same, absolute tolerance

Permutation vectors

`invorder()` inverse of permutation vector

`revorder()` reverse of permutation vector

Matrices into vectors & vice versa

`vec()` convert matrix into column vector

`vech()` convert symmetric matrix into column vector

`invvech()` convert column vector into symmetric matrix

`rowshape()` reshape matrix to have \( r \) rows

`colshape()` reshape matrix to have \( c \) columns

Associate arrays

`asarray()` store or retrieve element in array

`asarray_*()` utility routines

Description

The above functions manipulate matrices, such as extracting the diagonal and sorting.

Remarks and examples

There is a thin line between manipulation and utility; also see

[M-4] Utility Matrix utility functions

Also see

[M-4] Intro — Categorical guide to Mata functions