The Data Frame Reference Manual

Data frames for Common Lisp, version 1.1

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Table of Contents

1 Systems 1

1.1 `data-frame` 1

2 Files 3

2.1 Lisp 3

2.1.1 `data-frame.asd` 3

2.1.2 `data-frame/pkgdcl.lisp` 3

2.1.3 `data-frame/utils.lisp` 3

2.1.4 `data-frame/data-frame.lisp` 3

2.1.5 `data-frame/pprint.lisp` 5

2.1.6 `data-frame/summary.lisp` 5

2.1.7 `data-frame/defdf.lisp` 6

2.1.8 `data-frame/missing.lisp` 6

3 Packages 9

3.1 `data-frame` 9

4 Definitions 13

4.1 Exported definitions 13

4.1.1 Special variables 13

4.1.2 Macros 13

4.1.3 Functions 13

4.1.4 Generic functions 17

4.1.5 Conditions 19

4.1.6 Classes 19

4.2 Internal definitions 20

4.2.1 Special variables 20

4.2.2 Macros 20

4.2.3 Functions 21

4.2.4 Generic functions 26

4.2.5 Structures 26

4.2.6 Classes 29

Appendix A Indexes 31

A.1 Concepts 31

A.2 Functions 32

A.3 Variables 35

A.4 Data types 36

1 Systems

The main system appears first, followed by any subsystem dependency.

1.1 data-frame

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Source Control
(:git "https://github.com/lisp-stat/data-frame.git")

Bug Tracker
https://github.com/Lisp-Stat/data-frame/issues

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Description
Data frames for Common Lisp

Long Description
A data manipulation package, conceptually similar to R's data.frame, but with a lisp-oriented API.

Version 1.1

Dependencies
- alexandria
- anaphora
- array-operations
- num-utils
- select
- let-plus

Source [data-frame.asd], page 3, (file)

Directory s:/src/data-frame/

Components
- [pkgdcl.lisp], page 3, (file)
- [utils.lisp], page 3, (file)
- [data-frame.lisp], page 3, (file)
- [pprint.lisp], page 5, (file)
- [summary.lisp], page 5, (file)
- [defdf.lisp], page 6, (file)
- [missing.lisp], page 6, (file)

2 Files

Files are sorted by type and then listed depth-first from the systems components trees.

2.1 Lisp

2.1.1 data-frame.asd

Location /src/data-frame/data-frame.asd

Systems [data-frame], page 1, (system)

2.1.2 data-frame/pkgdcl.lisp

Parent [data-frame], page 1, (system)

Location pkgdcl.lisp

Packages [data-frame], page 9,

2.1.3 data-frame/utils.lisp

Dependency
[pkgdcl.lisp], page 3, (file)

Parent [data-frame], page 1, (system)

Location utils.lisp

Exported Definitions
[column-type], page 14, (function)

Internal Definitions

- [get-type], page 23, (function)
- [types-in-column], page 25, (function)

2.1.4 data-frame/data-frame.lisp

Dependency
[utils.lisp], page 3, (file)

Parent [data-frame], page 1, (system)

Location data-frame.lisp

Exported Definitions

- [add-column!], page 13, (function)
- [add-columns], page 13, (function)
- [add-columns!], page 13, (function)
- [alist-df], page 13, (function)
- [alist-dv], page 13, (function)
- [column], page 14, (function)
- [(setf column)], page 14, (function)
- [columns], page 14, (function)
- [copy], page 14, (function)
- [count-rows], page 14, (function)
- [data-frame], page 19, (class)

- [data-vector], page 20, (class)
- [df], page 14, (function)
- [df-remove-duplicates], page 15, (function)
- [do-rows], page 15, (function)
- [duplicate-key], page 19, (condition)
- [dv], page 15, (function)
- [key-not-found], page 19, (condition)
- [keys], page 15, (function)
- [make-df], page 15, (function)
- [make-dv], page 15, (function)
- [map-columns], page 15, (function)
- [map-df], page 15, (function)
- [map-rows], page 16, (function)
- [mask-rows], page 16, (function)
- [matrix-df], page 16, (function)
- [plist-df], page 16, (function)
- [plist-dv], page 16, (function)
- [remove-columns], page 16, (function)
- [replace-column], page 17, (function)
- [replace-column!], page 17, (function)
- [rows], page 17, (function)
- [substitute-key!], page 17, (function)

Internal Definitions

- [2d-array-to-list], page 21, (function)
- [add-key!], page 21, (function)
- [add-keys], page 21, (function)
- [alist-data], page 21, (function)
- [check-column-compatibility], page 26, (generic function)
- [check-column-compatibility], page 26, (method)
- [check-column-compatibility], page 26, (method)
- [copy-ordered-keys], page 22, (function)
- [data], page 29, (class)
- [define-data-subclass], page 20, (macro)
- [ensure-arguments-alist], page 22, (function)
- [guess-alist?], page 23, (function)
- [key-index], page 23, (function)
- [keys-count], page 23, (function)
- [keys-vector], page 23, (function)
- [make-data], page 23, (function)
- [make-ordered-keys], page 23, (function)
- [ordered-keys], page 24, (function)
- [ordered-keys], page 27, (structure)
- [ordered-keys-p], page 24, (function)
- [ordered-keys-table], page 24, (function)
- [plist-data], page 24, (function)

2.1.5 data-frame/pprint.lisp

Dependency
[data-frame.lisp], page 3, (file)

Parent [data-frame], page 1, (system)

Location pprint.lisp

Exported Definitions
- [*column-summary-minimum-length*], page 13, (special variable)
- [column-names], page 17, (method)
- [head], page 18, (method)
- [pprint-array], page 16, (function)
- [pprint-data-frame], page 16, (function)
- [pprint-markdown], page 16, (function)
- [tail], page 18, (method)

Internal Definitions
- [*max-digits*], page 20, (special variable)
- [*row-numbers-p*], page 20, (special variable)
- [column-type-format], page 21, (function)
- [default-column-formats], page 26, (method)
- [max-decimal], page 24, (function)
- [max-width], page 24, (function)
- [printer-status], page 24, (function)
- [reverse-df], page 25, (function)

2.1.6 data-frame/summary.lisp

Dependency
[pprint.lisp], page 5, (file)

Parent [data-frame], page 1, (system)

Location summary.lisp

Exported Definitions
- [column-summary], page 17, (generic function)
- [column-summary], page 17, (method)
- [column-summary], page 17, (method)
- [summary], page 18, (method)

Internal Definitions
- [*column-summary-quantiles-threshold*], page 20, (special variable)
- [bit-vector-summary], page 26, (structure)
- [bit-vector-summary-count], page 21, (function)
- [bit-vector-summary-length], page 21, (function)
- [bit-vector-summary-p], page 21, (function)
- [column-length], page 26, (generic function)
- [column-length], page 26, (method)
- [copy-bit-vector-summary], page 21, (function)

- [copy-generic-vector-summary], page 21, (function)
- [copy-quantiles-summary], page 22, (function)
- [copy-vector-summary%], page 22, (function)
- [ensure-not-ratio], page 22, (function)
- [generic-vector-summary], page 27, (structure)
- [generic-vector-summary-element-count-alist], page 22, (function)
- [generic-vector-summary-length], page 22, (function)
- [generic-vector-summary-p], page 22, (function)
- [generic-vector-summary-quantiles], page 22, (function)
- [make-bit-vector-summary], page 23, (function)
- [make-generic-vector-summary], page 23, (function)
- [make-quantiles-summary], page 24, (function)
- [make-vector-summary%], page 24, (function)
- [print-count-and-percentage], page 24, (function)
- [quantiles-summary], page 28, (structure)
- [quantiles-summary-count], page 25, (function)
- [quantiles-summary-max], page 25, (function)
- [quantiles-summary-min], page 25, (function)
- [quantiles-summary-p], page 25, (function)
- [quantiles-summary-q25], page 25, (function)
- [quantiles-summary-q50], page 25, (function)
- [quantiles-summary-q75], page 25, (function)
- [vector-summary%], page 29, (structure)
- [vector-summary%-length], page 25, (function)
- [vector-summary%-p], page 25, (function)

2.1.7 data-frame/defdf.lisp

Dependency
[summary.lisp], page 5, (file)

Parent [data-frame], page 1, (system)

Location defdf.lisp

Exported Definitions
- [define-column-names], page 14, (function)
- [define-data-frame], page 13, (macro)
- [make-data-package], page 15, (function)

Internal Definitions
- [replace-key!], page 20, (macro)
- [show-symbols], page 25, (function)

2.1.8 data-frame/missing.lisp

Dependency
[defdf.lisp], page 6, (file)

Parent [data-frame], page 1, (system)

Location `missing.lisp`

Exported Definitions

- [`drop-missing`], page 18, (method)
- [`missingp`], page 18, (generic function)
- [`missingp`], page 18, (method)
- [`missingp`], page 18, (method)
- [`missingp`], page 18, (method)
- [`missingp`], page 18, (method)
- [`missingp`], page 18, (method)
- [`missingp`], page 18, (method)
- [`replace-missing`], page 18, (method)

Internal Definitions

[`drop-na`], page 22, (function)

3 Packages

Packages are listed by definition order.

3.1 data-frame

Source [pkgdcl.lisp], page 3, (file)

Nicknames

- dframe
- df

Use List

- select-dev
- select
- let-plus
- anaphora
- alexandria
- common-lisp

Used By List

lisp-stat

Exported Definitions

- [*column-summary-minimum-length*], page 13, (special variable)
- [add-column!], page 13, (function)
- [add-columns], page 13, (function)
- [add-columns!], page 13, (function)
- [alist-df], page 13, (function)
- [alist-dv], page 13, (function)
- [column], page 14, (function)
- [(setf column)], page 14, (function)
- [column-names], page 17, (generic function)
- [column-names], page 17, (method)
- [column-summary], page 17, (generic function)
- [column-summary], page 17, (method)
- [column-summary], page 17, (method)
- [column-type], page 14, (function)
- [columns], page 14, (function)
- [copy], page 14, (function)
- [count-rows], page 14, (function)
- [data-frame], page 19, (class)
- [data-vector], page 20, (class)
- [define-column-names], page 14, (function)
- [define-data-frame], page 13, (macro)
- [df], page 14, (function)
- [df-remove-duplicates], page 15, (function)

- [do-rows], page 15, (function)
- [drop-missing], page 18, (generic function)
- [drop-missing], page 18, (method)
- [duplicate-key], page 19, (condition)
- [dv], page 15, (function)
- [head], page 18, (generic function)
- [head], page 18, (method)
- [key-not-found], page 19, (condition)
- [keys], page 15, (function)
- [make-data-package], page 15, (function)
- [make-df], page 15, (function)
- [make-dv], page 15, (function)
- [map-columns], page 15, (function)
- [map-df], page 15, (function)
- [map-rows], page 16, (function)
- [mask-rows], page 16, (function)
- [matrix-df], page 16, (function)
- [missingp], page 18, (generic function)
- [missingp], page 18, (method)
- [missingp], page 18, (method)
- [missingp], page 18, (method)
- [missingp], page 18, (method)
- [missingp], page 18, (method)
- [missingp], page 18, (method)
- [plist-df], page 16, (function)
- [plist-dv], page 16, (function)
- [pprint-array], page 16, (function)
- [pprint-data-frame], page 16, (function)
- [pprint-markdown], page 16, (function)
- [remove-columns], page 16, (function)
- [replace-column], page 17, (function)
- [replace-column!], page 17, (function)
- [replace-missing], page 18, (generic function)
- [replace-missing], page 18, (method)
- [rows], page 17, (function)
- [substitute-key!], page 17, (function)
- [summary], page 18, (generic function)
- [summary], page 18, (method)
- [tail], page 18, (generic function)
- [tail], page 18, (method)

Internal Definitions

- [*column-summary-quantiles-threshold*], page 20, (special variable)
- [*max-digits*], page 20, (special variable)

- [*row-numbers-p*], page 20, (special variable)
- [2d-array-to-list], page 21, (function)
- [add-key!], page 21, (function)
- [add-keys], page 21, (function)
- [alist-data], page 21, (function)
- [bit-vector-summary], page 26, (structure)
- [bit-vector-summary-count], page 21, (function)
- [bit-vector-summary-length], page 21, (function)
- [bit-vector-summary-p], page 21, (function)
- [check-column-compatibility], page 26, (generic function)
- [check-column-compatibility], page 26, (method)
- [check-column-compatibility], page 26, (method)
- [column-length], page 26, (generic function)
- [column-length], page 26, (method)
- [column-type-format], page 21, (function)
- [copy-bit-vector-summary], page 21, (function)
- [copy-generic-vector-summary], page 21, (function)
- [copy-ordered-keys], page 22, (function)
- [copy-quantiles-summary], page 22, (function)
- [copy-vector-summary%], page 22, (function)
- [data], page 29, (class)
- [default-column-formats], page 26, (generic function)
- [default-column-formats], page 26, (method)
- [define-data-subclass], page 20, (macro)
- [drop-na], page 22, (function)
- [ensure-arguments-alist], page 22, (function)
- [ensure-not-ratio], page 22, (function)
- [generic-vector-summary], page 27, (structure)
- [generic-vector-summary-element-count-alist], page 22, (function)
- [generic-vector-summary-length], page 22, (function)
- [generic-vector-summary-p], page 22, (function)
- [generic-vector-summary-quantiles], page 22, (function)
- [get-type], page 23, (function)
- [guess-alist?], page 23, (function)
- [key-index], page 23, (function)
- [keys-count], page 23, (function)
- [keys-vector], page 23, (function)
- [make-bit-vector-summary], page 23, (function)
- [make-data], page 23, (function)
- [make-generic-vector-summary], page 23, (function)
- [make-ordered-keys], page 23, (function)
- [make-quantiles-summary], page 24, (function)
- [make-vector-summary%], page 24, (function)

- [max-decimal], page 24, (function)
- [max-width], page 24, (function)
- [ordered-keys], page 24, (function)
- [ordered-keys], page 27, (structure)
- [ordered-keys-p], page 24, (function)
- [ordered-keys-table], page 24, (function)
- [plist-data], page 24, (function)
- [print-count-and-percentage], page 24, (function)
- [printer-status], page 24, (function)
- [quantiles-summary], page 28, (structure)
- [quantiles-summary-count], page 25, (function)
- [quantiles-summary-max], page 25, (function)
- [quantiles-summary-min], page 25, (function)
- [quantiles-summary-p], page 25, (function)
- [quantiles-summary-q25], page 25, (function)
- [quantiles-summary-q50], page 25, (function)
- [quantiles-summary-q75], page 25, (function)
- [replace-key!], page 20, (macro)
- [reverse-df], page 25, (function)
- [show-symbols], page 25, (function)
- [types-in-column], page 25, (function)
- [vector-summary%], page 29, (structure)
- [vector-summary%-length], page 25, (function)
- [vector-summary%-p], page 25, (function)

4 Definitions

Definitions are sorted by export status, category, package, and then by lexicographic order.

4.1 Exported definitions

4.1.1 Special variables

`*column-summary-minimum-length*` [Special Variable]
Columns are only summarised when longer than this, otherwise they are returned as is.

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

4.1.2 Macros

`define-data-frame` *DF BODY* **&optional** *DOC* [Macro]

Package [`data-frame`], page 9,

Source [`defdf.lisp`], page 6, (file)

4.1.3 Functions

`add-column!` *DATA KEY COLUMN* [Function]
Modify DATA (a data-frame or data-vector) by adding COLUMN with KEY. Return DATA.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`add-columns` *DATA* **&rest** *KEYS-AND-COLUMNS* [Function]
Return a new data-frame or data-vector with keys and columns added. Does not modify DATA (see README about accepted argument formats).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`add-columns!` *DATA* **&rest** *KEYS-AND-COLUMNS* [Function]
Modify DATA (a data-frame or data-vector) by adding columns with keys (see README about accepted argument formats).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`alist-df` *ALIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`alist-dv` *ALIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`column` *DATA KEY* [Function]
Return column corresponding to key.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Writer [`(setf column)`], page 14, (function)

`(setf column)` *COLUMN DATA KEY* [Function]
Set column corresponding to key.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Reader [`column`], page 14, (function)

`column-type` *COL* [Function]
Return the most specific type found in COL

Package [`data-frame`], page 9,

Source [`utils.lisp`], page 3, (file)

`columns` *DATA* **&optional** *SLICE* [Function]
Return the columns of DATA as a vector, or a selection if given (keys are resolved).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`copy` *DATA* **&key** *KEY* [Function]
Copy data frame or vector. Keys are copied (and thus can be modified), columns or elements are copyied using KEY, making the default give a shallow copy.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`count-rows` *DATA-FRAME KEYS PREDICATE* [Function]
Count the number of rows for which PREDICATE called on the columns corresponding to KEYS returns non-NIL.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`define-column-names` *DF* [Function]
Create a symbol macro for each column name in DF

After running this function, you can refer to a column by its name. This is useful if the column names of a data frame have changed.

Example: (define-column-names mtcars)

Package [`data-frame`], page 9,

Source [`defdf.lisp`], page 6, (file)

`df` **&rest** *PLIST-OR-ALIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`df-remove-duplicates` *DATA* [Function]
Return a modified copy of DATA from which any element (row, if a DATA-FRAME) that matches another element has been removed

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`do-rows` *DATA-FRAME KEYS FUNCTION* [Function]
Traverse rows from first to last, calling FUNCTION on the columns corresponding to KEYS. Return no values.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`dv` **&rest** *PLIST-OR-ALIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`keys` *DATA* [Function]
Vector of keys.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`make-data-package` *PKG-NAME* [Function]
Create a package and import and change *PACKAGE* Example: (make-data-package 'mtcars)

Package [`data-frame`], page 9,

Source [`defdf.lisp`], page 6, (file)

`make-df` *KEYS COLUMNS* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`make-dv` *KEYS COLUMNS* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`map-columns` *DATA FUNCTION* **&optional** *RESULT-CLASS* [Function]
Map columns of DATA-FRAME or DATA-VECTOR using FUNCTION. The result is a new DATA-FRAME with the same keys.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`map-df` *DATA-FRAME KEYS FUNCTION RESULT-KEYS* [Function]
Map DATA-FRAME to another one by rows. Function is called on the columns corresponding to KEYS, and should return a sequence with the same length as RESULT-KEYS, which give the keys of the resulting data frame. RESULT-KETS should be either symbols, or of the format (symbol &optional (element-type t)).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`map-rows` *DATA-FRAME KEYS FUNCTION* **&key** *ELEMENT-TYPE* [Function]
Map rows using FUNCTION, on the columns corresponding to KEYS. Return the result with the given ELEMENT-TYPE.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`mask-rows` *DATA-FRAME KEYS PREDICATE* [Function]
Return a bit-vector containing the result of calling PREDICATE on rows of the columns corresponding to KEYS (0 for NIL, 1 otherwise).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`matrix-df` *KEYS MATRIX* [Function]
Convert a matrix to a data-frame with the given keys.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`plist-df` *PLIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`plist-dv` *PLIST* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`pprint-array` *ARR* **&optional** *STREAM ROW-NUMBERS-P* [Function]
Print an array to STREAM, defaulting to *standard-output*, in a tabular format. If ROW-NUMBERS-P, print row numbers.

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`pprint-data-frame` *DATA-FRAME* **&optional** *STREAM ROW-NUMBERS-P MAX-DIGITS* [Function]
Return a 2D array of string suitable for pretty printing

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`pprint-markdown` *DF* **&key** *STREAM ROW-NUMBERS* [Function]
Print data frame DF, in markdown format, to STREAM
If ROW-NUMBERS is true, also print row numbers as the first column

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`remove-columns` *DATA KEYS* [Function]
ARGS: DATA data frame
KEYS list of keys (variables) to be removed
Return a new data-frame or data-vector with keys and columns removed. Does not modify DATA.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`replace-column` *DATA KEY FUNCTION-OR-COLUMN* **&key** *ELEMENT-TYPE* [Function]

Create a new data frame with new column KEY from data-frame DATA by replacing it either with the given column, or applying the function to the current values (ELEMENT-TYPE is used.)

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`replace-column!` *DATA KEY FUNCTION-OR-COLUMN* **&key** *ELEMENT-TYPE* [Function]

Modify column KEY of data-frame DATA by replacing it either with the given column, or applying the function to the current values (ELEMENT-TYPE is used.)

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`rows` *DATA* [Function]

Return the rows of DATA as a vector

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`substitute-key!` *DF NEW OLD* [Function]

Substitute NEW key, a SYMBOL, for OLD in a data-frame.

Useful when reading data files that have an empty or generated column name.

Example: (substitute-key *cars* :name :||) to replace an empty symbol with :name

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

4.1.4 Generic functions

`column-names` *DF* [Generic Function]

Package [`data-frame`], page 9,

Methods

`column-names` (*DF* `data-frame`) [Method]

Return a list column names in DF, as strings

Source [`pprint.lisp`], page 5, (file)

`column-summary` *COLUMN* [Generic Function]

Return an object that summarizes COLUMN of a DATA-FRAME. Primarily intended for printing, not analysis, returned values should print nicely.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Methods

`column-summary` (*COLUMN* `bit-vector`) [Method]

`column-summary` (*COLUMN* `vector`) [Method]

`drop-missing` *DF* **&optional** *PREDICATE* [Generic Function]

Package [data-frame], page 9,

Methods

`drop-missing` (*DF* `data-frame`) **&optional** *PREDICATE* [Method]

Remove all rows from DF that are missing values according to PREDICATE

Source [missing.lisp], page 6, (file)

`head` *DF* **&optional** *N* [Generic Function]

Package [data-frame], page 9,

Methods

`head` (*DF* `data-frame`) **&optional** *N* [Method]

Return the first N rows of DF; N defaults to 6

Source [pprint.lisp], page 5, (file)

`missingp` *DATA* [Generic Function]

Package [data-frame], page 9,

Source [missing.lisp], page 6, (file)

Methods

`missingp` *DATA* [Method]

`missingp` (*DATA* `(eql na)`) [Method]

`missingp` (*DATA* `string`) [Method]

`missingp` (*DATA* `sequence`) [Method]

`missingp` (*DATA* `array`) [Method]

`missingp` (*DATA* `data-frame`) [Method]

`replace-missing` *DF MAP-ALIST* [Generic Function]

Package [data-frame], page 9,

Methods

`replace-missing` (*DF* `data-frame`) *MAP-ALIST* [Method]

Replace missing values with the values specified
The alist consists of a column name in the CAR and the replacement value in the CDR Example: (replace-missing mtcarsm '((mtcarsm:mpg . foo)))

Source [missing.lisp], page 6, (file)

`summary` *DF* **&optional** *STREAM* [Generic Function]

Package [data-frame], page 9,

Methods

`summary` (*DF* `data-frame`) **&optional** *STREAM* [Method]

Source [summary.lisp], page 5, (file)

`tail` *DF* **&optional** *N* [Generic Function]

Package [data-frame], page 9,

Methods

`tail` (*DF* `data-frame`) **&optional** *N* [Method]

Return the last N rows of DF; N defaults to 6

Source [pprint.lisp], page 5, (file)

4.1.5 Conditions

`duplicate-key` () [Condition]

Duplicate key.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses

`error` (condition)

Direct slots

`key` [Slot]

Initargs `:key`

`key-not-found` () [Condition]

Key not found.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses

`error` (condition)

Direct slots

`key` [Slot]

Initargs `:key`

`keys` [Slot]

Initargs `:keys`

4.1.6 Classes

`data-frame` () [Class]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses

[`data`], page 29, (class)

Direct methods

- [`replace-missing`], page 18, (method)
- [`drop-missing`], page 18, (method)
- [`missingp`], page 18, (method)
- [`summary`], page 18, (method)
- `print-object` (method)
- [`column-names`], page 17, (method)
- [`tail`], page 18, (method)
- [`head`], page 18, (method)
- `select` (method)
- [`check-column-compatibility`], page 26, (method)
- `as-array` (method)

- `dims` (method)
- `ncol` (method)
- `nrow` (method)
- `initialize-instance` (method)

`data-vector` () [Class]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses
[`data`], page 29, (class)

Direct methods
- `print-object` (method)
- `select` (method)
- `as-array` (method)
- `dims` (method)

4.2 Internal definitions

4.2.1 Special variables

`*column-summary-quantiles-threshold*` [Special Variable]
If the number of reals exceeds this threshold, they will be summarized with quantiles.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`*max-digits*` [Special Variable]

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`*row-numbers-p*` [Special Variable]

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

4.2.2 Macros

`define-data-subclass` *CLASS ABBREVIATION* [Macro]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`replace-key!` *DF NEW OLD* [Macro]
Replace a key in DF, updating data package symbols Example: (replace-key mtcars row-name x1)

Package [`data-frame`], page 9,

Source [`defdf.lisp`], page 6, (file)

4.2.3 Functions

`2d-array-to-list` *ARRAY* [Function]
Convert an array to a list of lists

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`add-key!` *ORDERED-KEYS KEY* [Function]
Modify ORDERED-KEYS by adding KEY.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`add-keys` *ORDERED-KEYS* **&rest** *KEYS* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`alist-data` *CLASS ALIST* [Function]
Create an object of CLASS (subclass of DATA) from ALIST which contains key-column pairs.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`bit-vector-summary-count` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`bit-vector-summary-length` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`bit-vector-summary-p` *OBJECT* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`column-type-format` *SEQUENCE* [Function]
Return a format string for the most specific type found in sequence Use this for sequences of type T to determine how to format the column.

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`copy-bit-vector-summary` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`copy-generic-vector-summary` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`copy-ordered-keys` *ORDERED-KEYS* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`copy-quantiles-summary` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`copy-vector-summary%` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`drop-na` *DF* [Function]

Remove all rows from DF that are missing values. Convenience R-like function.

Package [`data-frame`], page 9,

Source [`missing.lisp`], page 6, (file)

`ensure-arguments-alist` *REST* [Function]

Recognizes the following and converts them to an alist:

plist
alist
(plist)
(alist)
(data-frame)

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`ensure-not-ratio` *REAL* [Function]

When REAL is a RATIO, convert it to a float, otherwise return as is. Used for printing.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`generic-vector-summary-element-count-alist` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`generic-vector-summary-length` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`generic-vector-summary-p` *OBJECT* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`generic-vector-summary-quantiles` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`get-type` *X* [Function]
Return the most specific type symbol for x

Package [`data-frame`], page 9,

Source [`utils.lisp`], page 3, (file)

`guess-alist?` *PLIST-OR-ALIST* [Function]
Test if the argument is an ALIST by checking its first element. Used for deciding which creation function to call.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`key-index` *ORDERED-KEYS KEY* [Function]
Return the index for KEY.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`keys-count` *ORDERED-KEYS* [Function]
Number of keys.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`keys-vector` *ORDERED-KEYS* [Function]
Vector of all keys.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`make-bit-vector-summary` **&key** (*LENGTH* **LENGTH**) (*COUNT* **COUNT**) [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`make-data` *CLASS KEYS COLUMNS* [Function]
Create a DATA object from KEYS and COLUMNS. FOR INTERNAL USE. Always creates a copy of COLUMNS in order to ensure that it is an adjustable array with a fill pointer. KEYS are converted to ORDERED-KEYS if necessary.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`make-generic-vector-summary` **&key** (*LENGTH* **LENGTH**) (*QUANTILES* **QUANTILES**) (*ELEMENT-COUNT-ALIST* **ELEMENT-COUNT-ALIST**) [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`make-ordered-keys` **&key** (*TABLE* **TABLE**) [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`make-quantiles-summary` **&key** (*COUNT* **COUNT**) (*MIN* **MIN**) (*Q25* **Q25**) (*Q50* **Q50**) (*Q75* **Q75**) (*MAX* **MAX**) [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`make-vector-summary%` **&key** (*LENGTH* **LENGTH**) [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`max-decimal` *SEQUENCE* **&optional** *MAX-DIGITS* [Function]

Return the maximum number of digits to the right of the decimal point in the numbers of SEQUENCE, equal to or less than MAX-DIGITS

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`max-width` *SEQUENCE* **&optional** *MAX-WIDTH* [Function]

Return the largest printed string size of the elements of SEQUENCE, equal to or less than MAX-WIDTH

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`ordered-keys` *KEYS* [Function]

Create an ORDERED-KEYS object from KEYS (a sequence).

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`ordered-keys-p` *OBJECT* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`ordered-keys-table` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`plist-data` *CLASS PLIST* [Function]

Create an object of CLASS (subclass of DATA) from PLIST which contains keys and columns, interleaved.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

`print-count-and-percentage` *STREAM COUNT LENGTH* [Function]

Print COUNT as is and also as a rounded percentage of

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`printer-status` () [Function]

Print values of all the printer variables

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`quantiles-summary-count` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-max` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-min` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-p` *OBJECT* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-q25` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-q50` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`quantiles-summary-q75` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`reverse-df` *DF* [Function]

Return DF with columns in reverse order

Package [`data-frame`], page 9,

Source [`pprint.lisp`], page 5, (file)

`show-symbols` *PKG* [Function]

Print all symbols in PKG Example: (show-symbols 'mtcars)

Package [`data-frame`], page 9,

Source [`defdf.lisp`], page 6, (file)

`types-in-column` *SEQ* [Function]

Return a list of the types found in SEQ

Package [`data-frame`], page 9,

Source [`utils.lisp`], page 3, (file)

`vector-summary%-length` *INSTANCE* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

`vector-summary%-p` *OBJECT* [Function]

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

4.2.4 Generic functions

`check-column-compatibility` *DATA COLUMN* [Generic Function]
Check if COLUMN is compatible with DATA.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Methods

`check-column-compatibility` (*DATA* `data-frame`) *COLUMN* [Method]

`check-column-compatibility` (*DATA* `data`) *COLUMN* [Method]

`column-length` *COLUMN* [Generic Function]
Return the length of column.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Methods

`column-length` (*COLUMN* `vector`) [Method]

`default-column-formats` *ARRAY* [Generic Function]

Package [`data-frame`], page 9,

Methods

`default-column-formats` (*ARRAY* `simple-array`) [Method]
Return a list of formatting strings for ARRAY
The method returns a set of default formatting strings using heuristics.

Source [`pprint.lisp`], page 5, (file)

4.2.5 Structures

`bit-vector-summary` () [Structure]
Summary of a bit vector.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Direct superclasses
[`vector-summary%`], page 29, (structure)

Direct methods
`print-object` (method)

Direct slots

`count` [Slot]

Type `alexandria:array-index`

Initform `0`

Readers [`bit-vector-summary-count`], page 21, (function)

Writers `(setf bit-vector-summary-count)` (function)

`generic-vector-summary` () [Structure]
Summary for generic vectors.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Direct superclasses
[`vector-summary%`], page 29, (structure)

Direct methods
`print-object` (method)

Direct slots

`quantiles` [Slot]

Type `(or null data-frame::quantiles-summary)`

Readers [`generic-vector-summary-quantiles`], page 22, (function)

Writers `(setf generic-vector-summary-quantiles)` (function)

`element-count-alist` [Slot]

Type `list`

Readers [`generic-vector-summary-element-count-alist`], page 22, (function)

Writers `(setf generic-vector-summary-element-count-alist)` (function)

`ordered-keys` () [Structure]
Representation of ordered keys.

TABLE maps keys to indexes, starting from zero.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses
`structure-object` (structure)

Direct methods

- `print-object` (method)
- `select` (method)
- `canonical-representation` (method)
- `axis-dimension` (method)

Direct slots

`table` [Slot]

Type `hash-table`

Initform `(make-hash-table :test (function eq))`

Readers [`ordered-keys-table`], page 24, (function)

Writers `(setf ordered-keys-table)` (function)

`quantiles-summary` () [Structure]

Summary of a real elements (using quantiles).

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Direct superclasses

`structure-object` (structure)

Direct slots

`count` [Slot]

Type `alexandria:array-index`

Initform `0`

Readers [`quantiles-summary-count`], page 25, (function)

Writers `(setf quantiles-summary-count)` (function)

`min` [Slot]

Type `real`

Initform `0`

Readers [`quantiles-summary-min`], page 25, (function)

Writers `(setf quantiles-summary-min)` (function)

`q25` [Slot]

Type `real`

Initform `0`

Readers [`quantiles-summary-q25`], page 25, (function)

Writers `(setf quantiles-summary-q25)` (function)

`q50` [Slot]

Type `real`

Initform `0`

Readers [`quantiles-summary-q50`], page 25, (function)

Writers `(setf quantiles-summary-q50)` (function)

`q75` [Slot]

Type `real`

Initform `0`

Readers [`quantiles-summary-q75`], page 25, (function)

Writers `(setf quantiles-summary-q75)` (function)

`max` [Slot]

Type `real`

Initform `0`

Readers [`quantiles-summary-max`], page 25, (function)

Writers `(setf quantiles-summary-max)` (function)

`vector-summary%` () [Structure]

Base class for summarizing vectors. Not exported.

Package [`data-frame`], page 9,

Source [`summary.lisp`], page 5, (file)

Direct superclasses

`structure-object` (structure)

Direct subclasses

- [`bit-vector-summary`], page 26, (structure)
- [`generic-vector-summary`], page 27, (structure)

Direct slots

`length` [Slot]

Type `alexandria:array-index`

Initform `0`

Readers [`vector-summary%-length`], page 25, (function)

Writers `(setf vector-summary%-length)` (function)

4.2.6 Classes

`data` () [Class]

This class is used for implementing both data-vector and data-matrix, and represents an ordered collection of key-column pairs. Columns are not assumed to have any specific attributes. This class is not exported.

Package [`data-frame`], page 9,

Source [`data-frame.lisp`], page 3, (file)

Direct superclasses

`standard-object` (class)

Direct subclasses

- [`data-vector`], page 20, (class)
- [`data-frame`], page 19, (class)

Direct methods

- `as-alist` (method)
- [`check-column-compatibility`], page 26, (method)
- `element-type` (method)

Direct slots

`ordered-keys` [Slot]

Type `data-frame::ordered-keys`

Initargs `:ordered-keys`

`columns` [Slot]

Type `vector`

Initargs `:columns`

Appendix A Indexes

A.1 Concepts

D

data-frame.asd 3
data-frame/data-frame.lisp 3
data-frame/defdf.lisp 6
data-frame/missing.lisp 6
data-frame/pkgdcl.lisp 3
data-frame/pprint.lisp 5
data-frame/summary.lisp 5
data-frame/utils.lisp 3

F

File, Lisp, data-frame.asd 3
File, Lisp, data-frame/data-frame.lisp 3
File, Lisp, data-frame/defdf.lisp 6
File, Lisp, data-frame/missing.lisp 6
File, Lisp, data-frame/pkgdcl.lisp 3
File, Lisp, data-frame/pprint.lisp 5
File, Lisp, data-frame/summary.lisp 5
File, Lisp, data-frame/utils.lisp 3

L

Lisp File, data-frame.asd 3
Lisp File, data-frame/data-frame.lisp 3
Lisp File, data-frame/defdf.lisp 6
Lisp File, data-frame/missing.lisp 6
Lisp File, data-frame/pkgdcl.lisp 3
Lisp File, data-frame/pprint.lisp 5
Lisp File, data-frame/summary.lisp 5
Lisp File, data-frame/utils.lisp 3

A.2 Functions

(

(setf column) 14

2

2d-array-to-list 21

A

add-column! 13
add-columns 13
add-columns! 13
add-key! 21
add-keys 21
alist-data 21
alist-df 13
alist-dv 13

B

bit-vector-summary-count 21
bit-vector-summary-length 21
bit-vector-summary-p 21

C

check-column-compatibility 26
column 14
column-length 26
column-names 17
column-summary 17
column-type 14
column-type-format 21
columns 14
copy 14
copy-bit-vector-summary 21
copy-generic-vector-summary 21
copy-ordered-keys 22
copy-quantiles-summary 22
copy-vector-summary% 22
count-rows 14

D

default-column-formats 26
define-column-names 14
define-data-frame 13
define-data-subclass 20
df 14
df-remove-duplicates 15
do-rows 15
drop-missing 18
drop-na 22
dv 15

E

ensure-arguments-alist 22
ensure-not-ratio 22

F

Function, (setf column) 14
Function, 2d-array-to-list 21
Function, add-column! 13
Function, add-columns 13
Function, add-columns! 13
Function, add-key! 21
Function, add-keys 21
Function, alist-data 21
Function, alist-df 13
Function, alist-dv 13
Function, bit-vector-summary-count 21
Function, bit-vector-summary-length 21
Function, bit-vector-summary-p 21
Function, column 14
Function, column-type 14
Function, column-type-format 21
Function, columns 14
Function, copy 14
Function, copy-bit-vector-summary 21
Function, copy-generic-vector-summary 21
Function, copy-ordered-keys 22
Function, copy-quantiles-summary 22
Function, copy-vector-summary% 22
Function, count-rows 14
Function, define-column-names 14
Function, df 14
Function, df-remove-duplicates 15
Function, do-rows 15
Function, drop-na 22
Function, dv 15
Function, ensure-arguments-alist 22
Function, ensure-not-ratio 22
Function, generic-vector-summary-element-count-alist 22
Function, generic-vector-summary-length 22
Function, generic-vector-summary-p 22
Function, generic-vector-summary-quantiles 22
Function, get-type 23
Function, guess-alist? 23
Function, key-index 23
Function, keys 15
Function, keys-count 23
Function, keys-vector 23
Function, make-bit-vector-summary 23
Function, make-data 23
Function, make-data-package 15
Function, make-df 15
Function, make-dv 15
Function, make-generic-vector-summary 23
Function, make-ordered-keys 23
Function, make-quantiles-summary 24
Function, make-vector-summary% 24
Function, map-columns 15
Function, map-df 15
Function, map-rows 16
Function, mask-rows 16
Function, matrix-df 16
Function, max-decimal 24
Function, max-width 24
Function, ordered-keys 24
Function, ordered-keys-p 24

Function, ordered-keys-table 24
Function, plist-data 24
Function, plist-df 16
Function, plist-dv 16
Function, pprint-array 16
Function, pprint-data-frame 16
Function, pprint-markdown 16
Function, print-count-and-percentage 24
Function, printer-status 24
Function, quantiles-summary-count 25
Function, quantiles-summary-max 25
Function, quantiles-summary-min 25
Function, quantiles-summary-p 25
Function, quantiles-summary-q25 25
Function, quantiles-summary-q50 25
Function, quantiles-summary-q75 25
Function, remove-columns 16
Function, replace-column 17
Function, replace-column! 17
Function, reverse-df 25
Function, rows 17
Function, show-symbols 25
Function, substitute-key! 17
Function, types-in-column 25
Function, vector-summary%-length 25
Function, vector-summary%-p 25

G

Generic Function, check-column-compatibility 26
Generic Function, column-length 26
Generic Function, column-names 17
Generic Function, column-summary 17
Generic Function, default-column-formats 26
Generic Function, drop-missing 18
Generic Function, head 18
Generic Function, missingp 18
Generic Function, replace-missing 18
Generic Function, summary 18
Generic Function, tail 18
generic-vector-summary-element-count-alist 22
generic-vector-summary-length 22
generic-vector-summary-p 22
generic-vector-summary-quantiles 22
get-type 23
guess-alist? 23

H

head 18

K

key-index 23
keys 15
keys-count 23
keys-vector 23

M

Macro, define-data-frame 13
Macro, define-data-subclass 20
Macro, replace-key! 20
make-bit-vector-summary 23
make-data 23
make-data-package 15
make-df 15
make-dv 15
make-generic-vector-summary 23
make-ordered-keys 23
make-quantiles-summary 24
make-vector-summary% 24
map-columns 15
map-df 15
map-rows 16
mask-rows 16
matrix-df 16
max-decimal 24
max-width 24
Method, check-column-compatibility 26
Method, column-length 26
Method, column-names 17
Method, column-summary 17
Method, default-column-formats 26
Method, drop-missing 18
Method, head 18
Method, missingp 18
Method, replace-missing 18
Method, summary 18
Method, tail 18
missingp 18

O

ordered-keys 24
ordered-keys-p 24
ordered-keys-table 24

P

plist-data 24
plist-df 16
plist-dv 16
pprint-array 16
pprint-data-frame 16
pprint-markdown 16
print-count-and-percentage 24
printer-status 24

Q

quantiles-summary-count 25
quantiles-summary-max 25
quantiles-summary-min 25
quantiles-summary-p 25
quantiles-summary-q25 25
quantiles-summary-q50 25
quantiles-summary-q75 25

R

remove-columns 16
replace-column 17
replace-column! 17
replace-key! 20
replace-missing 18
reverse-df 25
rows 17

S

show-symbols 25
substitute-key! 17
summary 18

T

tail 18
types-in-column 25

V

vector-summary%-length 25
vector-summary%-p 25

A.3 Variables

*

column-summary-minimum-length 13
column-summary-quantiles-threshold 20
max-digits 20
row-numbers-p 20

C

columns 29
count 26, 28

E

element-count-alist 27

K

key 19
keys 19

L

length 29

M

max 28
min 28

O

ordered-keys 29

Q

q25 28
q50 28
q75 28
quantiles 27

S

Slot, columns 29
Slot, count 26, 28
Slot, element-count-alist 27
Slot, key 19
Slot, keys 19
Slot, length 29
Slot, max 28
Slot, min 28
Slot, ordered-keys 29
Slot, q25 28
Slot, q50 28
Slot, q75 28
Slot, quantiles 27
Slot, table 27
Special Variable,
column-summary-minimum-length 13
Special Variable,
column-summary-quantiles-threshold 20
Special Variable, *max-digits* 20
Special Variable, *row-numbers-p* 20

T

table 27

A.4 Data types

B

`bit-vector-summary` 26

C

Class, `data` 29
Class, `data-frame` 19
Class, `data-vector` 20
Condition, `duplicate-key` 19
Condition, `key-not-found` 19

D

`data` 29
`data-frame` 1, 9, 19
`data-vector` 20
`duplicate-key` 19

G

`generic-vector-summary` 27

K

`key-not-found` 19

O

`ordered-keys` 27

P

Package, `data-frame` 9

Q

`quantiles-summary` 28

S

Structure, `bit-vector-summary` 26
Structure, `generic-vector-summary` 27
Structure, `ordered-keys` 27
Structure, `quantiles-summary` 28
Structure, `vector-summary%` 29
System, `data-frame` 1

V

`vector-summary%` 29