

The Data Frame I/O Reference Manual

Common Lisp library for reading and writing data-frames, version 2.0

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1 Systems

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

1.1 dfio

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License

MS-PL

Description

Common Lisp library for reading and writing data-frames

Version

2.0

Dependencies

- alexandria
- anaphora
- cl-csv
- data-frame
- let-plus

Source

[dfio.asd], page 3, (file)

Directory

s:/src/dfio/

Components

- [pkgdcl.lisp], page 3, (file)
- [decimal.lisp], page 3, (file)
- [string-table.lisp], page 3, (file)
- [data-column.lisp], page 4, (file)
- [utils.lisp], page 4, (file)
- [delimited-text.lisp], page 4, (file)

2 Files

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

2.1 Lisp

2.1.1 dfio.asd

Location dfio.asd

Systems [dfio], page 1, (system)

2.1.2 dfio/pkgdcl.lisp

Parent [dfio], page 1, (system)

Location pkgdcl.lisp

Packages

- [dfio.data-column], page 7,
- [dfio], page 7,
- [dfio.string-table], page 8,
- [dfio.decimal], page 8,

2.1.3 dfio/decimal.lisp

Dependency

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

Parent [dfio], page 1, (system)

Location decimal.lisp

Exported Definitions

- [parse-rational], page 9, (function)
- [parse-rational-error], page 12, (condition)
- [parse-real], page 10, (function)

Internal Definitions

- [+exponent-chars+], page 14, (special variable)
- [gobble-positive-integer], page 14, (function)
- [gobble-sign], page 14, (function)

2.1.4 dfio/string-table.lisp

Dependency

[decimal.lisp], page 3, (file)

Parent [dfio], page 1, (system)

Location string-table.lisp

Exported Definitions

- [string-table], page 10, (function)
- [string-table], page 12, (structure)
- [string-table-add], page 10, (function)
- [string-table-count], page 10, (function)

- [string-table-duplicate], page 12, (condition)
- [string-table-intern], page 11, (function)
- [string-table-lookup], page 11, (function)
- [string-table-not-found], page 12, (condition)
- [string-table-strings], page 11, (function)

Internal Definitions

- [copy-string-table], page 14, (function)
- [string-table-get], page 15, (function)
- [(setf string-table-get)], page 15, (function)
- [string-table-p], page 15, (function)
- [string-table-table], page 15, (function)
- [(setf string-table-table)], page 15, (function)

2.1.5 dfio/data-column.lisp

Dependency

[string-table.lisp], page 3, (file)

Parent [dfio], page 1, (system)

Location data-column.lisp

Exported Definitions

- [data-column], page 9, (function)
- [data-column], page 13, (class)
- [data-column-add], page 9, (function)
- [data-column-counts], page 9, (function)
- [data-column-vector], page 9, (function)

Internal Definitions

[non-negative-integer], page 15, (type)

2.1.6 dfio/utils.lisp

Dependency

[data-column.lisp], page 4, (file)

Parent [dfio], page 1, (system)

Location utils.lisp

Exported Definitions

- [string-to-keyword], page 11, (function)
- [string-to-symbol], page 11, (function)

2.1.7 dfio/delimited-text.lisp

Dependency

[utils.lisp], page 4, (file)

Parent [dfio], page 1, (system)

Location delimited-text.lisp

Exported Definitions

- [read-csv], page 10, (function)

- `[write-csv]`, page 11, (function)

Internal Definitions

- `[csv-to-data-columns]`, page 14, (function)

3 Packages

Packages are listed by definition order.

3.1 dfio.data-column

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

Use List

- let-plus
- [dfio.string-table], page 8,
- [dfio.decimal], page 8,
- anaphora
- common-lisp

Used By List

[dfio], page 7,

Exported Definitions

- [data-column], page 9, (function)
- [data-column], page 13, (class)
- [data-column-add], page 9, (function)
- [data-column-counts], page 9, (function)
- [data-column-vector], page 9, (function)

Internal Definitions

[non-negative-integer], page 15, (type)

3.2 dfio

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

Use List

- [dfio.data-column], page 7,
- let-plus
- anaphora
- alexandria
- common-lisp

Exported Definitions

- [read-csv], page 10, (function)
- [string-to-keyword], page 11, (function)
- [string-to-symbol], page 11, (function)
- [write-csv], page 11, (function)

Internal Definitions

[csv-to-data-columns], page 14, (function)

3.3 dfio.string-table

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

Use List

- let-plus
- anaphora
- alexandria
- common-lisp

Used By List

[dfio.data-column], page 7,

Exported Definitions

- [string-table], page 10, (function)
- [string-table], page 12, (structure)
- [string-table-add], page 10, (function)
- [string-table-count], page 10, (function)
- [string-table-duplicate], page 12, (condition)
- [string-table-intern], page 11, (function)
- [string-table-lookup], page 11, (function)
- [string-table-not-found], page 12, (condition)
- [string-table-strings], page 11, (function)

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- [copy-string-table], page 14, (function)
- [string-table-get], page 15, (function)
- [(setf string-table-get)], page 15, (function)
- [string-table-p], page 15, (function)
- [string-table-table], page 15, (function)
- [(setf string-table-table)], page 15, (function)

3.4 dfio.decimal

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

Use List

- let-plus
- anaphora
- common-lisp

Used By List

[dfio.data-column], page 7,

Exported Definitions

- [parse-rational], page 9, (function)
- [parse-rational-error], page 12, (condition)
- [parse-real], page 10, (function)

Internal Definitions

- [+exponent-chars+], page 14, (special variable)
- [gobble-positive-integer], page 14, (function)
- [gobble-sign], page 14, (function)

4 Definitions

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

4.1 Exported definitions

4.1.1 Functions

`data-column` *&key MAP-ALIST DEFAULT-FLOAT-FORMAT* [Function]

Package [dfio.data-column], page 7,

Source [data-column.lisp], page 4, (file)

`data-column-add` *DATA-COLUMN STRING* [Function]

Package [dfio.data-column], page 7,

Source [data-column.lisp], page 4, (file)

`data-column-counts` *DATA-COLUMN* [Function]

Return the counts.

Package [dfio.data-column], page 7,

Source [data-column.lisp], page 4, (file)

`data-column-vector` *DATA-COLUMN* [Function]

Return the collected elements as a vector.

Package [dfio.data-column], page 7,

Source [data-column.lisp], page 4, (file)

`parse-rational` *STRING &key START END EXPONENT-CHARS* [Function]

Parse a decimal rational in (subseq string start end) of the form [sign][whole].[fraction]][exponent] where

sign ::= + | - | empty

whole ::= digit*

fraction ::= digit*

exponent ::= exponent-char[sign]digit+

with the restriction that WHOLE and FRACTION cannot be empty at the same time. EXPONENT-CHAR is a string and contains the valid exponent chars.

Whitespace is NOT trimmed, and leads to an error. In case of a parsing failure, PARSE-RATIONAL-ERROR is used.

Return (values NUMBER DECIMAL-DOT? EXPONENT-CHAR). NUMBER is a RATIONAL, DECIMAL-DOT? is T when a decimal dot is present, otherwise NIL, EXPONENT-CHAR contains the exponent character, NIL if not present.

Numbers of the form .112 and 112. are valid syntax, representing 0.112 and 112.0, respectively.

Examples:

```
(parse-rational "7") => (values 7 NIL NIL)
(parse-rational "7.") => (values 7 T NIL)
(parse-rational "0.7") => (values 7/10 T NIL)
(parse-rational ".7") => (values 7/10 T NIL)
(parse-rational "7.e2") => (values 700 T #e)
(parse-rational ".7d1") => (values 7 T #d)
```

Package [dfio.decimal], page 8,

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

parse-real *STRING &key START END S-FLOAT F-FLOAT D-FLOAT L-FLOAT E-FLOAT* [Function]

Wrapper for PARSE-RATIONAL, converting non-integers to floats. The float type is determined by the -float arguments for each exponent character. Integers are not converted to floats. Return a single value, type of (or integer float).

See PARSE-RATIONAL for accepted formats, errors, etc.

Package [dfio.decimal], page 8,

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

read-csv *STREAM-OR-STRING &key SKIP-FIRST-ROW? COLUMN-KEYS-OR-FUNCTION PACKAGE MAP-ALIST* [Function]

Read a CSV file, stream, or string into a DATA-FRAME, which is returned.

When SKIP-FIRST-ROW?, the first row is read separately and COLUMN-KEYS-OR-FUNCTION is used to form column keys.

When COLUMN-KEYS-OR-FUNCTION is a sequence, it is used for column keys, regardless of the value of SKIP-FIRST-ROW?.

PACKAGE indicates the package to intern column names into.

MAP-ALIST maps values during the import. This is useful if you want special mappings for missing, though the mechanism is general.

Package [dfio], page 7,

Source [delimited-text.lisp], page 4, (file)

string-table *&key (TABLE TABLE)* [Function]

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-table-add *STRING-TABLE STRING &optional VALUE* [Function]

Add STRING mapped to VALUE to STRING-TABLE, raising STRING-TABLE-DUPLICATE if STRING is already in the table. Return VALUE.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-table-count *STRING-TABLE* [Function]

Number of distinct strings in the table.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-table-intern *STRING-TABLE STRING &optional NEW-VALUE* [Function]

If *STRING* is already in *STRING-TABLE*, return its value, otherwise add it and return *NEW-VALUE*. When used with the default argument for *NEW-VALUE*, *EQUAL* strings are always mapped to values that are *EQ*.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-table-lookup *STRING-TABLE STRING* [Function]

Return the value corresponding to *STRING* in *STRING-TABLE*, or raise the *STRING-TABLE-NOT-FOUND* error.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-table-strings *STRING-TABLE* [Function]

List of strings in *STRING-TABLE*.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

string-to-keyword *STRING* [Function]

Map string to a keyword.

The current implementation replaces *#.* and *#space* with a *#-*, and upcases all other characters.

Package [dfio], page 7,

Source [utils.lisp], page 4, (file)

string-to-symbol *STRING* [Function]

Map *STRING* to a symbol in *PACKAGE*, replacing *#.*, *#-* and *#space* with a *#-*, and upcasing all other characters. Exports symbol.

Package [dfio], page 7,

Source [utils.lisp], page 4, (file)

write-csv *DF &key STREAM ADD-FIRST-ROW (SEPARATOR SEPARATOR) (QUOTE QUOTE) (ESCAPE QUOTE-ESCAPE) (NEWLINE WRITE-NEWLINE) (ALWAYS-QUOTE ALWAYS-QUOTE)* [Function]

Write a data-frame to a stream.

Keywords:

stream: stream to write to. Default: nil.

nil - writes the rows to a string and returns it
an open stream

a pathname (overwrites if the file exists)

quote: quoting character. Defaults to **quote**

escape: escaping character. Defaults to **quote-escape**

newline: newline character. Defaults to **write-newline**

always-quote: Defaults to **always-quote**

add-first-row: Add column names as the first

Notes:

The `:newline` keyword requires a sequence, so use `:newline '(#newline)` or use `cl-interpol`

Package [dfio], page 7,

Source [delimited-text.lisp], page 4, (file)

4.1.2 Conditions

`parse-rational-error ()` [Condition]

Error used by `parse-rational` and `parse-real`.

Package [dfio.decimal], page 8,

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

Direct superclasses
error (condition)

Direct slots

string [Slot]

Initargs :string

Initform (quote nil)

message [Slot]

Initargs :message

Initform (quote nil)

`string-table-duplicate ()` [Condition]

String is already in the table.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

Direct superclasses
error (condition)

`string-table-not-found ()` [Condition]

String not found in table.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

Direct superclasses
error (condition)

4.1.3 Structures

`string-table ()` [Structure]

A table of distinct strings, optionally mapping each one to a value.

Package [dfio.string-table], page 8,

Source [string-table.lisp], page 3, (file)

Direct superclasses
structure-object (structure)

Direct methods

`print-object` (method)

Direct slots

<code>table</code>		[Slot]
Type	<code>hash-table</code>	
Initform	<code>(make-hash-table :test (function equalp))</code>	
Readers	<code>[string-table-table]</code> , page 15, (function)	
Writers	<code>[(setf string-table-table)]</code> , page 15, (function)	

4.1.4 Classes

`data-column` () [Class]

Package `[dfio.data-column]`, page 7,

Source `[data-column.lisp]`, page 4, (file)

Direct superclasses

`standard-object` (class)

Direct slots

<code>reverse-elements</code>		[Slot]
Type	<code>list</code>	
<code>default-float-format</code>		[Slot]
Type	<code>symbol</code>	
Initargs	<code>:default-float-format</code>	
<code>float-count</code>		[Slot]
Type	<code>dfio.data-column::non-negative-integer</code>	
Initform	<code>0</code>	
<code>integer-count</code>		[Slot]
Type	<code>dfio.data-column::non-negative-integer</code>	
Initform	<code>0</code>	
<code>integer-min</code>		[Slot]
Type	<code>integer</code>	
Initform	<code>0</code>	
<code>integer-max</code>		[Slot]
Type	<code>integer</code>	
Initform	<code>0</code>	
<code>map-count</code>		[Slot]
Type	<code>dfio.data-column::non-negative-integer</code>	
Initform	<code>0</code>	
<code>map-table</code>		[Slot]
Type	<code>dfio.string-table:string-table</code>	
Initargs	<code>:map-table</code>	

<code>string-count</code>	[Slot]
Type <code>dfio.data-column::non-negative-integer</code>	
Initform 0	
<code>string-table</code>	[Slot]
Type <code>dfio.string-table:string-table</code>	
Initform (<code>dfio.string-table:string-table</code>)	

4.2 Internal definitions

4.2.1 Special variables

<code>+exponent-chars+</code>	[Special Variable]
Default exponent characters.	
Package <code>[dfio.decimal]</code> , page 8,	
Source <code>[decimal.lisp]</code> , page 3, (file)	

4.2.2 Functions

<code>copy-string-table</code> <i>INSTANCE</i>	[Function]
Package <code>[dfio.string-table]</code> , page 8,	
Source <code>[string-table.lisp]</code> , page 3, (file)	
<code>csv-to-data-columns</code> <i>STREAM-OR-STRING SKIP-FIRST-ROW?</i> &key <i>MAP-ALIST</i>	[Function]
Read a CSV file (or stream, or string), accumulate the values in DATA-COLUMNS, return a list of these. Rows are checked to have the same number of elements.	
When SKIP-FIRST-ROW?, the first row is read separately and returned as the second value (list of strings), otherwise it is considered data like all other rows.	
Package <code>[dfio]</code> , page 7,	
Source <code>[delimited-text.lisp]</code> , page 4, (file)	
<code>gobble-positive-integer</code> <i>STRING START END</i>	[Function]
If (SUBSEQ STRING START END) starts with a nonnegative integer (ie a sequence of digits 0-9), return the integer and position at which it ends as two values.	
Otherwise, return NIL and 0.	
START < END has to hold, END cannot be NIL. Consequences are undefined when START >= END.	
Package <code>[dfio.decimal]</code> , page 8,	
Source <code>[decimal.lisp]</code> , page 3, (file)	
<code>gobble-sign</code> <i>STRING START</i>	[Function]
Return (values SIGNUM INDEX), where SIGNUM is -1 or 1 depending on whether (CHAR STRING START) was a sign, and INDEX is the index of the subsequent character (START or START+1).	
Package <code>[dfio.decimal]</code> , page 8,	
Source <code>[decimal.lisp]</code> , page 3, (file)	

`string-table-get` *STRING-TABLE STRING* [Function]
 Synonym for GETHASH, used internally.

Package [dfio.string-table], page 8,
Source [string-table.lisp], page 3, (file)
Writer [(setf string-table-get)], page 15, (function)

`(setf string-table-get)` *VALUE STRING-TABLE STRING* [Function]
 Synonym for (SETF GETHASH), used internally, checks that STRING is a string.

Package [dfio.string-table], page 8,
Source [string-table.lisp], page 3, (file)
Reader [string-table-get], page 15, (function)

`string-table-p` *OBJECT* [Function]

Package [dfio.string-table], page 8,
Source [string-table.lisp], page 3, (file)

`string-table-table` *INSTANCE* [Function]
`(setf string-table-table)` *VALUE INSTANCE* [Function]

Package [dfio.string-table], page 8,
Source [string-table.lisp], page 3, (file)

4.2.3 Types

`non-negative-integer` () [Type]

Package [dfio.data-column], page 7,
Source [data-column.lisp], page 4, (file)

Appendix A Indexes

A.1 Concepts

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