

Package ‘DT’

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Type Package

Title A Wrapper of the JavaScript Library 'DataTables'

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Description Data objects in R can be rendered as HTML tables using the JavaScript library 'DataTables' (typically via R Markdown or Shiny). The 'DataTables' library has been included in this R package. The package name 'DT' is an abbreviation of 'DataTables'.

URL <http://rstudio.github.io/DT>

BugReports <https://github.com/rstudio/DT/issues>

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Imports htmltools (>= 0.3.5), htmlwidgets (>= 0.6), magrittr

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datatable	<i>Create an HTML table widget using the DataTables library</i>
-----------	---

Description

This function creates an HTML widget to display rectangular data (a matrix or data frame) using the JavaScript library DataTables.

Usage

```
datatable(data, options = list(), class = "display", callback = JS("return table;"),
  rownames, colnames, container, caption = NULL, filter = c("none",
    "bottom", "top"), escape = TRUE, style = "default", width = NULL,
  height = NULL, elementId = NULL, fillContainer = getOption("DT.fillContainer",
    NULL), autoHideNavigation = getOption("DT.autoHideNavigation",
    NULL), selection = c("multiple", "single", "none"), extensions = list(),
  plugins = NULL)
```

Arguments

data	a data object (either a matrix or a data frame)
options	a list of initialization options (see http://datatables.net/reference/option/); the character options wrapped in <code>JS()</code> will be treated as literal JavaScript code instead of normal character strings; you can also set options globally via <code>options(DT.options = list())</code> and global options will be merged into this options argument if set
class	the CSS class(es) of the table; see http://datatables.net/manual/styling/classes
callback	the body of a JavaScript callback function with the argument table to be applied to the DataTables instance (i.e. table)
rownames	TRUE (show row names) or FALSE (hide row names) or a character vector of row names; by default, the row names are displayed in the first column of the table if exist (not NULL)

colnames	if missing, the column names of the data; otherwise it can be an unnamed character vector of names you want to show in the table header instead of the default data column names; alternatively, you can provide a <i>named</i> numeric or character vector of the form 'newName1' = i1, 'newName2' = i2 or c('newName1' = 'oldName1', 'newName2' = 'oldName2', ...), where newName is the new name you want to show in the table, and i or oldName is the index of the current column name
container	a sketch of the HTML table to be filled with data cells; by default, it is generated from <code>htmltools::tags\$table()</code> with a table header consisting of the column names of the data
caption	the table caption; a character vector or a tag object generated from <code>htmltools::tags\$caption()</code>
filter	whether/where to use column filters; none: no filters; bottom/top: put column filters at the bottom/top of the table; range sliders are used to filter numeric/date/time columns, select lists are used for factor columns, and text input boxes are used for character columns; if you want more control over the styles of filters, you can provide a list to this argument of the form <code>list(position = 'top', clear = TRUE, plain = FALSE)</code> , where <code>clear</code> indicates whether you want the clear buttons in the input boxes, and <code>plain</code> means if you want to use Bootstrap form styles or plain text input styles for the text input boxes
escape	whether to escape HTML entities in the table: TRUE means to escape the whole table, and FALSE means not to escape it; alternatively, you can specify numeric column indices or column names to indicate which columns to escape, e.g. 1:5 (the first 5 columns), <code>c(1, 3, 4)</code> , or <code>c(-1, -3)</code> (all columns except the first and third), or <code>c('Species', 'Sepal.Length')</code>
style	the style name (http://datatables.net/manual/styling/); currently only 'default' and 'bootstrap' are supported
width, height	Width/Height in pixels (optional, defaults to automatic sizing)
elementId	An id for the widget (a random string by default).
fillContainer	TRUE to configure the table to automatically fill it's containing element. If the table can't fit fully into it's container then vertical and/or horizontal scrolling of the table cells will occur.
autoHideNavigation	TRUE to automatically hide navigational UI when the number of total records is less than the page size.
selection	the row/column selection mode (single or multiple selection or disable selection) when a table widget is rendered in a Shiny app; alternatively, you can use a list of the form <code>list(mode = 'multiple', selected = c(1, 3, 8), target = 'row')</code> to pre-select rows; the element target in the list can be 'column' to enable column selection, or 'row+column' to make it possible to select both rows and columns (click on the footer to select columns), or 'cell' to select cells
extensions	a character vector of the names of the DataTables extensions (http://datatables.net/extensions/index)
plugins	a character vector of the names of DataTables plug-ins (http://rstudio.github.io/DT/plugins.html)

Note

You are recommended to escape the table content for security reasons (e.g. XSS attacks) when using this function in Shiny or any other dynamic web applications.

References

See <http://rstudio.github.io/DT> for the full documentation.

Examples

```
library(DT)

# see the package vignette for examples and the link to website
vignette('DT', package = 'DT')

# some boring edge cases for testing purposes
m = matrix(nrow = 0, ncol = 5, dimnames = list(NULL, letters[1:5]))
datatable(m) # zero rows
datatable(as.data.frame(m))

m = matrix(1, dimnames = list(NULL, 'a'))
datatable(m) # one row and one column
datatable(as.data.frame(m))

m = data.frame(a = 1, b = 2, c = 3)
datatable(m)
datatable(as.matrix(m))

# dates
datatable(data.frame(
  date = seq(as.Date("2015-01-01"), by = "day", length.out = 5), x = 1:5
))
datatable(data.frame(x = Sys.Date()))
datatable(data.frame(x = Sys.time()))
```

 dataTableAjax

Register a data object in a shiny session for DataTables

Description

This function stores a data object in a shiny session and returns a URL that returns JSON data based on DataTables Ajax requests. The URL can be used as the `url` option inside the `ajax` option of the table. It is basically an implementation of server-side processing of DataTables in R. Filtering, sorting, and pagination are processed through R instead of JavaScript (client-side processing).

Usage

```
dataTableAjax(session, data, rownames, filter = dataTableFilter, outputId)
```

Arguments

session	the session object in the shiny server function (function(input, output, session))
data	a data object (will be coerced to a data frame internally)
rownames	see <code>datatable()</code> ; it must be consistent with what you use in <code>datatable()</code> , e.g. if the widget is generated by <code>datatable(rownames = FALSE)</code> , you must also use <code>dataTableAjax(rownames = FALSE)</code> here
filter	(for expert use only) a function with two arguments data and params (Ajax parameters, a list of the form <code>list(search = list(value = 'F00', regex = 'false'), length = 10)</code> , that return the filtered table result according to the DataTables Ajax request
outputId	the output ID of the table (the same ID passed to <code>dataTableOutput()</code> ; if missing, a random string)

Details

Normally you should not need to call this function directly. It is called internally when a table widget is rendered in a Shiny app to configure the table option `ajax` automatically. If you are familiar with **DataTables**' server-side processing, and want to use a custom filter function, you may call this function to get an Ajax URL.

Value

A character string (an Ajax URL that can be queried by DataTables).

References

<http://rstudio.github.io/DT/server.html>

Examples

```
DTApp = function(data, ..., options = list()) {
  library(shiny)
  library(DT)
  shinyApp(
    ui = fluidPage(
      title = 'Server-side processing of DataTables',
      fluidRow(
        DT::dataTableOutput('tbl')
      )
    ),
    server = function(input, output, session) {
      options$serverSide = TRUE
      options$ajax = list(url = dataTableAjax(session, data))
      # create a widget using an Ajax URL created above
      widget = datatable(data, ..., options = options)
      output$tbl = DT::renderDataTable(widget)
    }
  )
}
```

```
if (interactive()) DTApp(iris)
if (interactive()) DTApp(iris, filter = 'top')
```

dataTableOutput *Helper functions for using DT in Shiny*

Description

These two functions are like most `fooOutput()` and `renderFoo()` functions in the **shiny** package. The former is used to create a container for table, and the latter is used in the server logic to render the table.

Usage

```
dataTableOutput(outputId, width = "100%", height = "auto")

renderDataTable(expr, server = TRUE, env = parent.frame(), quoted = FALSE, ...)
```

Arguments

<code>outputId</code>	output variable to read the table from
<code>width</code>	the width of the table container
<code>height</code>	the height of the table container
<code>expr</code>	an expression to create a table widget (normally via <code>datatable()</code>), or a data object to be passed to <code>datatable()</code> to create a table widget
<code>server</code>	whether to use server-side processing. If <code>TRUE</code> , then the data is kept on the server and the browser requests a page at a time; if <code>FALSE</code> , then the entire data frame is sent to the browser at once. Highly recommended for medium to large data frames, which can cause browsers to slow down or crash.
<code>env</code>	The environment in which to evaluate <code>expr</code> .
<code>quoted</code>	Is <code>expr</code> a quoted expression (with <code>quote()</code>)? This is useful if you want to save an expression in a variable.
<code>...</code>	ignored when <code>expr</code> returns a table widget, and passed as additional arguments to <code>datatable()</code> when <code>expr</code> returns a data object

References

<http://rstudio.github.io/DT/shiny.html>

Examples

```
if (interactive()) {
  library(shiny)
  shinyApp(
    ui = fluidPage(fluidRow(column(12, DT::dataTableOutput('tbl')))),
    server = function(input, output) {
      output$tbl = DT::renderDataTable(
        iris, options = list(lengthChange = FALSE)
      )
    }
  )
}
```

dataTableProxy

Manipulate an existing DataTables instance in a Shiny app

Description

The function `datatableProxy()` creates a proxy object that can be used to manipulate an existing `DataTables` instance in a Shiny app, e.g. select rows/columns, or add rows.

Usage

```
dataTableProxy(outputId, session = shiny::getDefaultReactiveDomain(),
  deferUntilFlush = TRUE)

selectRows(proxy, selected)

selectColumns(proxy, selected)

selectCells(proxy, selected)

addRow(proxy, data)

clearSearch(proxy)

selectPage(proxy, page)

updateCaption(proxy, caption)

updateSearch(proxy, keywords = list(global = NULL, columns = NULL))

reloadData(proxy, resetPaging = TRUE, clearSelection = c("all", "none",
  "row", "column", "cell"))
```

Arguments

outputId	the id of the table to be manipulated (the same id as the one you used in <code>dataTableOutput()</code>)
session	the Shiny session object (from the server function of the Shiny app)
deferUntilFlush	whether an action should be carried out right away, or should be held until after the next time all of the outputs are updated
proxy	a proxy object returned by <code>dataTableProxy()</code>
selected	an integer vector of row/column indices, or a matrix of two columns (row and column indices, respectively) for cell indices; you may use NULL to clear existing selections
data	a single row of data to be added to the table; it can be a matrix or data frame of one row, or a vector or list of row data (in the latter case, please be cautious about the row name: if your table contains row names, here data must also contain the row name as the first element)
page	a number indicating the page to select
caption	a new table caption (see the caption argument of <code>datatable()</code>)
keywords	a list of two components: global is the global search keyword of a single character string (ignored if NULL); columns is a character vector of the search keywords for all columns (when the table has one column for the row names, this vector of keywords should contain one keyword for the row names as well)
resetPaging	whether to reset the paging position
clearSelection	which existing selections to clear: it can be any combinations of row, column, and cell, or all for all three, or none to keep current selections (by default, all selections are cleared after the data is reloaded)

Note

`addRow()` only works for client-side tables. If you want to use it in a Shiny app, make sure to use `renderDataTable(..., server = FALSE)`.

`reloadData()` only works for tables in the server-side processing mode, e.g. tables rendered with `renderDataTable(server = TRUE)`. The data to be reloaded (i.e. the one you pass to `dataTableAjax()`) must have exactly the same number of columns as the previous data object in the table.

References

<http://rstudio.github.io/DT/shiny.html>

DT-imports	<i>Objects imported from other packages</i>
------------	---

Description

These objects are imported from other packages. Follow the links to their documentation.

htmlwidgets [JS](#), [saveWidget](#)

magrittr [%>%](#)

formatCurrency	<i>Format table columns</i>
----------------	-----------------------------

Description

Format numeric columns in a table as currency (`formatCurrency()`) or percentages (`formatPercentage()`), or round numbers to a specified number of decimal places (`formatRound()`), or a specified number of significant figures (`formatSignif()`). The function `formatStyle()` applies CSS styles to table cells by column.

Usage

```
formatCurrency(table, columns, currency = "$", interval = 3, mark = ",", digits = 2,
  dec.mark = getOption("OutDec"), before = TRUE)
```

```
formatString(table, columns, prefix = "", suffix = "")
```

```
formatPercentage(table, columns, digits = 0)
```

```
formatRound(table, columns, digits = 2)
```

```
formatSignif(table, columns, digits = 2)
```

```
formatDate(table, columns, method = "toDateString")
```

```
formatStyle(table, columns, valueColumns = columns, target = c("cell", "row"),
  fontWeight = NULL, color = NULL, backgroundColor = NULL, background = NULL,
  ...)
```

Arguments

table	a table object created from <code>datatable()</code>
columns	the indices of the columns to be formatted (can be character, numeric, logical, or a formula of the form $\sim V1 + V2$, which is equivalent to <code>c('V1', 'V2')</code>)
currency	the currency symbol

interval	put a marker after how many digits of the numbers
mark	the marker after every interval decimals in the numbers
digits	the number of decimal places to round to
dec.mark	a character to indicate the decimal point
before	whether to place the currency symbol before or after the values
prefix	string to put in front of the column values
suffix	string to put after the column values
method	the method(s) to convert a date to string in JavaScript; see <code>DT:::DateMethods</code> for a list of possible methods, and http://mz1.la/1xGe99W for a full reference
valueColumns	indices of the columns from which the cell values are obtained; this can be different with the <code>columns</code> argument, e.g. you may style one column based on the values of a different column
target	the target to apply the CSS styles to (the current cell or the full row)
fontWeight	the font weight, e.g. 'bold' and 'normal'
color	the font color, e.g. 'red' and '#ee00aa'
backgroundColor	the background color of table cells
background	the background of table cells
...	other CSS properties, e.g. 'border', 'font-size', 'text-align', and so on; if you want to condition CSS styles on the cell values, you may use the helper functions such as <code>styleInterval()</code> ; note the actual CSS property names are dash-separated, but you can use camelCase names in this function (otherwise you will have to use backticks to quote the names, e.g. <code>`font-size` = '12px'</code>), and this function will automatically convert camelCase names to dash-separated names (e.g. 'fontWeight' will be converted to 'font-weight' internally)

References

See <http://rstudio.github.io/DT/functions.html> for detailed documentation and examples.

Examples

```
library(DT)
m = cbind(matrix(rnorm(120, 1e5, 1e6), 40), runif(40), rnorm(40, 100))
colnames(m) = head(LETTERS, ncol(m))
m

# format the columns A and C as currency, and D as percentages
datatable(m) %>% formatCurrency(c('A', 'C')) %>% formatPercentage('D', 2)

# the first two columns are Euro currency, and round column E to 3 decimal places
datatable(m) %>% formatCurrency(1:2, '\u20AC') %>% formatRound('E', 3)

# render vapor pressure with only two significant figures.
datatable(pressure) %>% formatSignif('pressure',2)
```

```
# apply CSS styles to columns
datatable(iris) %>%
  formatStyle('Sepal.Length', fontWeight = styleInterval(5, c('bold', 'weight'))) %>%
  formatStyle('Sepal.Width',
    color = styleInterval(3.4, c('red', 'white')),
    backgroundColor = styleInterval(3.4, c('yellow', 'gray'))
  )
```

replaceData	<i>Replace data in an existing table</i>
-------------	--

Description

Replace the data object of a table output and avoid regenerating the full table, in which case the state of the current table will be preserved (sorting, filtering, and pagination) and applied to the table with new data.

Usage

```
replaceData(proxy, data, ..., resetPaging = TRUE, clearSelection = "all")
```

Arguments

proxy	a proxy object created by <code>dataTableProxy()</code>
data	the new data object to be loaded in the table
...	other arguments to be passed to <code>dataTableAjax()</code>
resetPaging, clearSelection	passed to <code>reloadData()</code>

Note

When you replace the data in an existing table, please make sure the new data has the same number of columns as the current data. When you have enabled column filters, you should also make sure the attributes of every column remain the same, e.g. factor columns should have the same or fewer levels, and numeric columns should have the same or smaller range, otherwise the filters may never be able to reach certain rows in the data.

styleInterval	<i>Conditional CSS styles</i>
---------------	-------------------------------

Description

A few helper functions for the `formatStyle()` function to calculate CSS styles for table cells based on the cell values. Under the hood, they just generate JavaScript and CSS code from the values specified in R.

Usage

```
styleInterval(cuts, values)
```

```
styleEqual(levels, values)
```

```
styleColorBar(data, color, angle = 90)
```

Arguments

<code>cuts</code>	a vector of cut points (sorted increasingly)
<code>values</code>	a vector of CSS values
<code>levels</code>	a character vector of data values to be mapped (one-to-one) to CSS values
<code>data</code>	a numeric vector whose range will be used for scaling the table data from 0-100 before being represented as color bars. A vector of length 2 is acceptable here for specifying a range possibly wider or narrower than the range of the table data itself.
<code>color</code>	the color of the bars
<code>angle</code>	a number of degrees representing the direction to fill the gradient relative to a horizontal line and the gradient line, going counter-clockwise. For example, 90 fills right to left and -90 fills left to right.

Details

The function `styleInterval()` maps intervals to CSS values. Its argument values must be of length $n + 1$ where $n = \text{length}(\text{cuts})$. The right-closed interval `(cuts[i - 1], cuts[i]]` is mapped to `values[i]` for `i = 2, 3, ..., n`; `values[1]` is for the interval `(-Inf, cuts[1]]`, and `values[n + 1]` is for `(cuts[n], +Inf)`. You can think of the order of cuts and values using this diagram: `'-Inf -> values[1] -> cuts[1] -> values[2] -> cuts[2] -> ... -> values[n] -> cuts[n] -> v +Inf'`.

The function `styleEqual()` maps data values to CSS values in the one-to-one manner, i.e. `values[i]` is used when the table cell value is `levels[i]`.

The function `styleColorBar()` can be used to draw background color bars behind table cells in a column, and the width of bars is proportional to the column values.

tableHeader	<i>Generate a table header or footer from column names</i>
-------------	--

Description

Convenience functions to generate a table header (`<thead></thead>`) or footer (`<tfoot></tfoot>`) given the column names. They are basically wrappers of `htmltools::tags$th` applied to the column names.

Usage

```
tableHeader(names, escape = TRUE)
```

```
tableFooter(names, escape = TRUE)
```

Arguments

names	a character vector of the column names of the table (if it is an object with column names, its column names will be used instead)
escape	whether to escape the names (see datatable)

Value

A tag object generated by `htmltools::tags`.

Examples

```
library(DT)
tableHeader(iris) # or equivalently,
tableHeader(colnames(iris))
tableFooter(iris) # footer

library(htmltools)
tags$table(tableHeader(iris), tableFooter(iris))
```

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