# Package 'xtable'

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Title Export tables to LaTeX or HTML
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<b>Description</b> Coerce data to LaTeX and HTML tables
<pre>URL http://xtable.r-forge.r-project.org/</pre>
<b>Depends</b> R (>= 2.10.0)
License GPL (>= 2)
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print.xtable

Print Export Tables

#### **Description**

Function returning and displaying or writing to disk the LaTeX or HTML code associated with the supplied object of class xtable.

#### Usage

```
## S3 method for class 'xtable'
print(x,
  type = getOption("xtable.type", "latex"),
  file = getOption("xtable.file", ""),
  append = getOption("xtable.append", FALSE),
  floating = getOption("xtable.floating", TRUE),
  floating.environment = getOption("xtable.floating.environment", "table"),
  table.placement = getOption("xtable.table.placement", "ht"),
  caption.placement = getOption("xtable.caption.placement", "bottom"),
  caption.width = getOption("xtable.caption.width", NULL),
  latex.environments = getOption("xtable.latex.environments", c("center")),
  tabular.environment = getOption("xtable.tabular.environment", "tabular"),
  size = getOption("xtable.size", NULL),
  hline.after = getOption("xtable.hline.after", c(-1,0,nrow(x))),
 NA.string = getOption("xtable.NA.string", ""),
  include.rownames = getOption("xtable.include.rownames", TRUE),
  include.colnames = getOption("xtable.include.colnames", TRUE),
  only.contents = getOption("xtable.only.contents", FALSE),
  add.to.row = getOption("xtable.add.to.row", NULL),
  sanitize.text.function = getOption("xtable.sanitize.text.function", NULL),
  sanitize.rownames.function = getOption("xtable.sanitize.rownames.function",
                                         sanitize.text.function),
  sanitize.colnames.function = getOption("xtable.sanitize.colnames.function",
                                         sanitize.text.function),
  math.style.negative = getOption("xtable.math.style.negative", FALSE),
  html.table.attributes = getOption("xtable.html.table.attributes",
                                    "border=1"),
  print.results = getOption("xtable.print.results", TRUE),
  format.args = getOption("xtable.format.args", NULL),
  rotate.rownames = getOption("xtable.rotate.rownames", FALSE),
  rotate.colnames = getOption("xtable.rotate.colnames", FALSE),
  booktabs = getOption("xtable.booktabs", FALSE),
  scalebox = getOption("xtable.scalebox", NULL),
 width = getOption("xtable.width", NULL),
  comment = getOption("xtable.comment", TRUE),
  timestamp = getOption("xtable.timestamp", date()),
  ...)
```

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# **Arguments**

An object of class "xtable". Х

Type of table to produce. Possible values for type are "latex" or "html". type

Default value is "latex".

file Name of file where the resulting code should be saved. If file="", output is

displayed on screen. Note that the function also (invisibly) returns a character vector of the results (which can be helpful for post-processing). Default value is

If TRUE and file!="", code will be appended to file instead of overwriting append

file. Default value is FALSE.

floating If TRUE and type="latex", the resulting table will be a floating table (using,

for example, \begin{table} and \end{table}). See floating.environment

below. Default value is TRUE.

floating.environment

If floating=TRUE and type="latex", the resulting table uses the specified floating environment. Possible values include "table", "table\*", and other floating environments defined in LaTeX packages. Default value is "table".

table.placement

If floating=TRUE and type="latex", the floating table will have placement given by table.placement where table.placement must be NULL or contain only elements of {"h","t","b","p","!","H"}. Default value is "ht".

caption.placement

The caption will be have placed at the bottom of the table if caption.placement is "bottom" and at the top of the table if it equals "top". Default value is "bottom".

caption.width The caption will be placed in a "parbox" of the specified width if caption.width is not NULL and type="latex". Default value is NULL.

latex.environments

If floating=TRUE and type="latex", the specificed latex environments (provided as a character vector) will enclose the tabular environment. Default value is "center".

tabular.environment

When type="latex", the tabular environment that will be used. Defaults to "tabular". When working with tables that extend more than one page, using tabular.environment="longtable" and the LaTeX package "longtable" (see Fairbairns, 2005) allows one to typeset them uniformly. Note that "floating" should be set to "FALSE" when using the "longtable" environment.

An arbitrary character vector intended to be used to set the font size in a La-TeX table. The supplied value (if not NULL) is inserted just before the tabular

environment starts. Default value is NULL.

When type="latex", a vector of numbers between -1 and "nrow(x)", inclusive, indicating the rows after which a horizontal line should appear. If NULL is used no lines are produced. Default value is c(-1,0,nrow(x)) which means draw a line before and after the columns names and at the end of the table.

Repeated values are allowed.

size

hline.after

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NA. string String to be used for missing values in table entries. Default value is "". include.rownames

logical. If TRUE the rows names is printed. Default value is TRUE.

include.colnames

logical. If TRUE the columns names is printed. Default value is TRUE.

only.contents logical. If TRUE only the rows of the table is printed. Default value is FALSE.

add.to.row a list of two components. The first component (which should be called 'pos') is

a list contains the position of rows on which extra commands should be added at the end, The second component (which should be called 'command') is a character vector of the same length of the first component which contains the command that should be added at the end of the specified rows. Default value is

NULL, i.e. do not add commands.

sanitize.text.function

All non-numeric enteries (except row and column names) are sanitised in an attempt to remove characters which have special meaning for the output format. If sanitize.text.function is not NULL (the default), it should be a function taking a character vector and returning one, and will be used for the sanitization instead of the default internal function.

sanitize.rownames.function

Like the sanitize.text.function, but applicable to row names. The default uses the sanitize.text.function.

sanitize.colnames.function

Like the sanitize.text.function, but applicable to column names. The default uses the sanitize.text.function.

math.style.negative

In a LaTeX table, if TRUE, then use \$-\$ for the negative sign (as was the behavior prior to version 1.5-3). Default value is FALSE.

html.table.attributes

In an HTML table, attributes associated with the <TABLE>tag. Default value is border=1.

print.results If TRUE, the generated table is printed to standard output. Set this to FALSE if

you will just be using the character vector that is returned invisibly.

format.args List of arguments for the formatC function. For example, standard German number separators can be specified as format.args=list(big.mark = "',", decimal.mark = ",")).

rotate.rownames

If TRUE, the row names are displayed vertically in LaTeX.

rotate.colnames

If TRUE, the column names are displayed vertically in LaTeX.

booktabs If TRUE, the toprule, midrule and bottomrule tags from the LaTex "booktabs"

package are used rather than hline for the horizontal line tags.

scalebox If not NULL, a scalebox clause will be added around the tabular environment

with the specified value used as the scaling factor.

width If not NULL, the specified value is included in parenthesis between the tabular

environment begin tag and the alignment specification. This allows specification of the table width when using tabular environments such as tabular\* and tabularx. Note that table width specification is not supported with the tabular

or longtable environments.

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comment If TRUE, the version and timestamp comment is included. Default value is TRUE.

timestamp Timestamp to include in LaTeX comment. Set this to NULL to exclude the timestamp. Default value is date().

Additional arguments. (Currently ignored.)

#### **Details**

This function displays or writes to disk the code to produce a table associated with an object x of class "xtable". The resulting code is either a LaTeX or HTML table, depending on the value of type. The function also (invisibly) returns a character vector of the results (which can be helpful for post-processing).

Since version 1.4 the non default behavior of hline.after is changed. To obtain the same results as the previous versions add to the hline.after vector the vector c(-1, 0, nrow(x)) where nrow(x) is the numbers of rows of the object.

From version 1.4-3, all non-numeric columns are sanitized, and all LaTeX special characters are sanitised for LaTeX output. See Section 3 of the xtableGallery vignette for an example of customising the sanitization. From version 1.4-4, the sanitization also applies to column names. To remove any text sanitization, specify sanitize.text.function=function(x){x}.

From version 1.6-1 the default values for the arguments other than x are obtainined using getOption(). Hence the user can set the values once with options() rather than setting them in every call to print.xtable().

# Author(s)

David Dahl <dahl@stat.tamu.edu> with contributions and suggestions from many others (see source code).

# References

Fairbairns, Robin (2005) *Tables longer than a single page* The UK List of TeX Frequently Asked Questions on the Web. http://www.tex.ac.uk/cgi-bin/texfaq2html?label=longtab

# See Also

xtable, caption, label, align, digits, display, formatC

string String handling functions

# **Description**

Private functions for conveniently working with strings.

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# Usage

```
string(text,file="",append=FALSE)
## S3 method for class 'string'
print(x,...)
## S3 method for class 'string'
x + y
as.string(x,file="",append=FALSE)
is.string(x)
```

# Arguments

text	A character object.
file	Name of the file that should receive the printed string
append	Should the printed string be appended to the file?
x	A string object.
у	A string object.
	Additional arguments. (Currently ignored.)

# **Details**

These functions are private functions used by print.xtable. They are not intended to be used elsewhere.

# Author(s)

David Dahl <dahl@stat.tamu.edu> with contributions and suggestions from many others (see source code).

# See Also

```
print.xtable
```

table.attributes

Retrieve and Set Options for Export Tables

# Description

Functions retrieving or setting table attributes for the supplied object of class "xtable".

tli 7

# Usage

```
caption(x,...)
caption(x) <- value
label(x,...)
label(x) <- value
align(x,...)
align(x) <- value
digits(x,...)
digits(x) <- value
display(x,...)
display(x) <- value</pre>
```

# **Arguments**

```
x An "xtable" object.value The value of the corresponding attribute.... Additional arguments. (Currently ignored.)
```

# **Details**

These functions retrieve or set table attributes of the object x of class "xtable". See xtable for a description of the options.

# Author(s)

David Dahl <dahl@stat.tamu.edu> with contributions and suggestions from many others (see source code).

# See Also

```
xtable, print.xtable, formatC
```

tli

Math scores from Texas Assessment of Academic Skills (TAAS)

# Description

This data set contains math scores and demographic data of 100 randomly selected students participating in the Texas Assessment of Academic Skills (TAAS).

# Usage

```
data(tli)
```

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# **Format**

A data frame containing 100 observations with the following columns:

```
grade Year in school of student
sex Gender of student
disadvg Is the student economically disadvantaged?
ethnicty Race of student
tlimth Math score of student
```

#### Source

Texas Education Agency, http://www.tea.state.tx.us

toLatex.xtable

Convert Table to Latex

# **Description**

Function creating a LaTeX representation of an object of class xtable.

# Usage

```
## S3 method for class 'xtable'
toLatex(object, ...)
```

# **Arguments**

object An object of class "xtable".
... Other arguments to print.xtable.

#### **Details**

This function creates a LaTeX representation of an object of class "xtable". This is a method for the generic "toLatex" in the core R package "utils".

# Author(s)

Charles Roosen <roosen@gmail.com> with contributions and suggestions from many others (see source code).

# See Also

```
print.xtable
```

xtable Create Export Tables
-----------------------------

#### **Description**

Function converting an R object to an xtable object, which can then be printed as a LaTeX or HTML table.

#### Usage

#### **Arguments**

x An R object of class found among methods(xtable). See below on how to write additional method functions for xtable.

Character vector of length 1 or 2 containing the table's caption or title. If length 2, the second item is the "short caption" used when LaTeX generates a "List of Tables". Set to NULL to suppress the caption. Default value is NULL.

Character vector of length 1 containing the LaTeX label or HTML anchor. Set to NULL to suppress the label. Default value is NULL.

Character vector of length equal to the number of columns of the resulting table indicating the alignment of the corresponding columns. Also, "|" may be used to produce vertical lines between columns in LaTeX tables, but these are effectively ignored when considering the required length of the supplied vector. If a character vector of length one is supplied, it is split as strsplit(align, "")[[1]] before processing. Since the row names are printed in the first column, the length of align is one greater than ncol(x) if x is a data.frame. Use "1", "r", and "c" to denote left, right, and center alignment, respectively. Use "p\{3cm\}" etc for a LaTeX column of the specified width. For HTML output the "p" alignment is interpreted as "1", ignoring the width request. Default depends on the class of x.

Numeric vector of length equal to one (in which case it will be replicated as necessary) or to the number of columns of the resulting table **or** matrix of the same size as the resulting table indicating the number of digits to display in the corresponding columns. Since the row names are printed in the first column, the length of the vector digits or the number of columns of the matrix digits is one greater than ncol(x) if x is a data.frame. Default depends of class of x. If values of digits are negative, the corresponding values of x are displayed in scientific format with abs(digits) digits.

Character vector of length equal to the number of columns of the resulting table indicating the format for the corresponding columns. Since the row names are printed in the first column, the length of display is one greater than ncol(x) if x is a data.frame. These values are passed to the formatC function. Use "d"

gumem

caption

label

align

digits

display

(for integers), "f", "e", "E", "g", "G", "fg" (for reals), or "s" (for strings). "f" gives numbers in the usual xxx.xxx format; "e" and "E" give n.ddde+nn or n.dddE+nn (scientific format); "g" and "G" put x[i] into scientific format only if it saves space to do so. "fg" uses fixed format as "f", but digits as number of *significant* digits. Note that this can lead to quite long result strings. Default depends on the class of x.

. Additional arguments. (Currently ignored.)

#### **Details**

This function extracts tabular information from x and returns an object of class "xtable". The nature of the table generated depends on the class of x. For example, aov objects produce ANOVA tables while data.frame objects produce a table of the entire data.frame. One can optionally provide a caption (called a title in HTML) or label (called an anchor in HTML), as well as formatting specifications. Default values for align, digits, and display are class dependent.

The available method functions for xtable are given by methods(xtable). Users can extend the list of available classes by writing methods for the generic function xtable. These methods functions should have x as their first argument with additional arguments to specify caption, label, align, digits, and display. Optionally, other arguments may be present to specify how the object x should be manipulated. All method functions should return an object whose class if given by c("xtable", "data.frame"). The resulting object can have attributes caption and label, but must have attributes align, digits, and display. It is strongly recommend that you set these attributes through the provided replacement functions as they perform validity checks.

#### Value

An object of class "xtable" which inherits the data.frame class and contains several additional attributes specifying the table formatting options.

#### Author(s)

David Dahl <dahl@stat.tamu.edu> with contributions and suggestions from many others (see source code).

#### See Also

```
print.xtable, caption, label, align, digits, display, formatC, methods
```

# **Examples**

```
## Load example dataset
data(tli)

## Demonstrate data.frame
tli.table <- xtable(tli[1:20, ])
digits(tli.table)[c(2, 6)] <- 0
print(tli.table)
print(tli.table, type = "html")</pre>
```

```
## Demonstrate data.frame with different digits in cells
tli.table <- xtable(tli[1:20, ])</pre>
digits(tli.table) <- matrix( 0:4, nrow = 20, ncol = ncol(tli)+1 )</pre>
print(tli.table)
print(tli.table, type = "html")
## Demonstrate matrix
design.matrix <- model.matrix(~ sex*grade, data = tli[1:20, ])</pre>
design.table <- xtable(design.matrix)</pre>
print(design.table)
print(design.table, type = "html")
## Demonstrate aov
fm1 <- aov(tlimth ~ sex + ethnicty + grade + disadvg, data = tli)</pre>
fm1.table <- xtable(fm1)</pre>
print(fm1.table)
print(fm1.table, type = "html")
## Demonstrate lm
fm2 <- lm(tlimth ~ sex*ethnicty, data = tli)</pre>
fm2.table <- xtable(fm2)</pre>
print(fm2.table)
print(fm2.table, type = "html")
print(xtable(anova(fm2)))
print(xtable(anova(fm2)), type = "html")
fm2b <- lm(tlimth ~ ethnicty, data = tli)</pre>
print(xtable(anova(fm2b, fm2)))
print(xtable(anova(fm2b, fm2)), type = "html")
## Demonstrate glm
fm3 <- glm(disadvg ~ ethnicty*grade, data = tli, family = binomial())</pre>
fm3.table <- xtable(fm3)</pre>
print(fm3.table)
print(fm3.table, type = "html")
print(xtable(anova(fm3)))
print(xtable(anova(fm3)), type = "html")
## Demonstrate aov
## Taken from help(aov) in R 1.1.1
## From Venables and Ripley (1997) p.210.
P \leftarrow c(1,1,0,0,0,1,0,1,1,1,0,0,0,1,0,1,1,0,0,1,0,1,1,0)
K \leftarrow c(1,0,0,1,0,1,1,0,0,1,0,1,1,0,0,0,1,1,1,0,1,0)
yield <- c(49.5,62.8,46.8,57.0,59.8,58.5,55.5,56.0,62.8,55.8,69.5,55.0,
           62.0,48.8,45.5,44.2,52.0,51.5,49.8,48.8,57.2,59.0,53.2,56.0)
npk <- data.frame(block = gl(6,4), N = factor(N), P = factor(P),</pre>
                  K = factor(K), yield = yield)
npk.aov <- aov(yield ~ block + N*P*K, npk)</pre>
op <- options(contrasts = c("contr.helmert", "contr.treatment"))</pre>
npk.aovE <- aov(yield ~ N*P*K + Error(block), npk)</pre>
options(op)
summary(npk.aov)
```

```
print(xtable(npk.aov))
print(xtable(anova(npk.aov)))
print(xtable(summary(npk.aov)))
summary(npk.aovE)
print(xtable(npk.aovE), type = "html")
print(xtable(summary(npk.aovE)), type = "html")
## Demonstrate lm
## Taken from help(lm) in R 1.1.1
## Annette Dobson (1990) "An Introduction to Generalized Linear Models".
## Page 9: Plant Weight Data.
ctl \leftarrow c(4.17, 5.58, 5.18, 6.11, 4.50, 4.61, 5.17, 4.53, 5.33, 5.14)
trt < c(4.81,4.17,4.41,3.59,5.87,3.83,6.03,4.89,4.32,4.69)
group \leftarrow gl(2,10,20, labels = c("Ctl","Trt"))
weight <- c(ctl, trt)</pre>
lm.D9 <- lm(weight ~ group)</pre>
print(xtable(lm.D9))
print(xtable(anova(lm.D9)))
## Demonstrate glm
## Taken from help(glm) in R 1.1.1
## Annette Dobson (1990) "An Introduction to Generalized Linear Models".
## Page 93: Randomized Controlled Trial :
counts <- c(18,17,15,20,10,20,25,13,12)
outcome <- gl(3,1,9)
treatment \leftarrow gl(3,3)
d.AD <- data.frame(treatment, outcome, counts)</pre>
glm.D93 <- glm(counts ~ outcome + treatment, family = poisson())</pre>
print(xtable(glm.D93, align = "r|llrc"))
print(xtable(anova(glm.D93)), hline.after = c(1), size = "small")
## Demonstration of additional formatC() arguments.
print(fm1.table, format.args = list(big.mark = "',", decimal.mark = ","))
## Demonstration of "short caption" support.
fm1sc <- aov(tlimth ~ sex + ethnicty + grade, data = tli)</pre>
fm1sc.table <- xtable(fm1sc,</pre>
  caption = c("ANOVA Model with Predictors Sex, Ethnicity, and Grade",
    "ANOVA: Sex, Ethnicity, Grade"))
print(fm1sc.table)
## Demonstration of longtable support.
## Remember to insert \usepackage{longtable} on your LaTeX preamble
x \leftarrow matrix(rnorm(1000), ncol = 10)
x.big <- xtable(x, label = 'tabbig',</pre>
                 caption = 'Example of longtable spanning several pages')
print(x.big, tabular.environment = 'longtable', floating = FALSE)
x <- x[1:30, ]
x.small <- xtable(x, label = 'tabsmall', caption = 'regular table env')</pre>
print(x.small) # default, no longtable
## Demonstration of sidewaystable support.
```

```
## Remember to insert \usepackage{rotating} on your LaTeX preamble
print(x.small, floating.environment = 'sidewaystable')
if(require(stats, quietly = TRUE)) {
 ## Demonstrate prcomp
 ## Taken from help(prcomp) in mva package of R 1.1.1
 data(USArrests)
 pr1 <- prcomp(USArrests)</pre>
 print(xtable(pr1))
 print(xtable(summary(pr1)))
# ## Demonstrate princomp
# ## Taken from help(princomp) in mva package of R 1.1.1
# pr2 <- princomp(USArrests)</pre>
# print(xtable(pr2))
## Demonstrate include.rownames, include.colnames,
## only.contents and add.to.row arguments
set.seed(2345)
res <- matrix(sample(0:9, size = 6*9, replace = TRUE), ncol = 6, nrow = 9)
xres <- xtable(res)</pre>
digits(xres) <- rep(0, 7)</pre>
addtorow <- list()</pre>
addtorow$pos <- list()</pre>
addtorowpos[[1]] \leftarrow c(0, 2)
addtorow$pos[[2]] <- 4
addtorow$command <- c('\vspace{2mm} \n', '\vspace{10mm} \n')</pre>
print(xres, add.to.row = addtorow, include.rownames = FALSE,
      include.colnames = TRUE, only.contents = TRUE,
      hline.after = c(0, 0, 9, 9)
## Demonstrate include.rownames, include.colnames,
## only.contents and add.to.row arguments in Rweave files
## Not run:
 \begin{small}
 \setlongtables
 \begin{longtable}{
 <<results = tex, fig = FALSE>>=
cat(paste(c('c', rep('cc', 34/2-1), 'c'), collapse = '@{\hspace{2pt}}'))
}
 \hline
 \endhead
 \hline
 \endfoot
 <<results = tex, fig = FALSE>>=
library(xtable)
 set.seed(2345)
 res <- matrix(sample(0:9, size = 34*90, replace = TRUE), ncol = 34, nrow = 90)
 xres <- xtable(res)</pre>
 digits(xres) <- rep(0, 35)
```

```
addtorow <- list()</pre>
 addtorow$pos <- list()</pre>
 addtorowpos[[1]] \leftarrow c(seq(4, 40, 5), seq(49, 85, 5))
 addtorow*pos[[2]] <- 45
 addtorow$command <- c('\vspace{2mm} \n', '\newpage \n')</pre>
 print(xres, add.to.row = addtorow, include.rownames = FALSE,
       include.colnames = FALSE, only.contents = TRUE, hline.after = NULL)
 \end{longtable}
 \ensuremath{\mbox{end}\{\mbox{small}\}}
## End(Not run)
## Demonstrate sanitization
mat <- round(matrix(c(0.9, 0.89, 200, 0.045, 2.0), c(1, 5)), 4)
rownames(mat) <- "$y_{t-1}$"
colnames(mat) <- c("$R^2$", "$\\bar{R}^2$", "F-stat", "S.E.E", "DW")
print(xtable(mat), type = "latex", sanitize.text.function = function(x){x})
## Demonstrate booktabs
print(tli.table)
print(tli.table, hline.after = c(-1,0))
print(tli.table, hline.after = NULL)
print(tli.table,
      add.to.row = list(pos = list(2), command = c("\vspace{2mm} \n")))
print(tli.table, booktabs = TRUE)
print(tli.table, booktabs = TRUE, hline.after = c(-1,0))
print(tli.table, booktabs = TRUE, hline.after = NULL)
print(tli.table, booktabs = TRUE,
  add.to.row = list(pos = list(2), command = c("\vspace{2mm} \n")))
print(tli.table, booktabs = TRUE, add.to.row = list(pos = list(2),
  command = c("youhou\n")), tabular.environment = "longtable")
```

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