

# Package ‘microplot’

January 26, 2022

**Type** Package

**Title** Microplots (Sparklines) in 'LaTeX', 'Word', 'HTML', 'Excel'

**Version** 1.0-45

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**Description** The microplot function writes a set of R graphics files to be used as microplots (sparklines) in tables in either 'LaTeX', 'HTML', 'Word', or 'Excel' files. For 'LaTeX', we provide methods for the `Hmisc::latex()` generic function to construct 'latex' tabular environments which include the graphs. These can be used directly with the operating system 'pdflatex' or 'latex' command, or by using one of 'Sweave', 'knitr', 'rmarkdown', or 'Emacs org-mode' as an intermediary. For 'MS Word', the `msWord()` function uses the 'flextable' package to construct 'Word' tables which include the graphs. There are several distinct approaches for constructing HTML files. The simplest is to use the `msWord()` function with argument `filetype="html"`. Alternatively, use either 'Emacs org-mode' or the `htmlTable::htmlTable()` function to construct an 'HTML' file containing tables which include the graphs. See the documentation for our `as.htmlimg()` function. For 'Excel' use on 'Windows', the file `examples/irisExcel.xls` includes 'VBA' code which brings the individual panels into individual cells in the spreadsheet. Examples in the `examples` and `demo` subdirectories are shown with 'lattice' graphics, 'ggplot2' graphics, and 'base' graphics. Examples for 'LaTeX' include 'Sweave' (both 'LaTeX'-style and 'Noweb'-style), 'knitr', 'emacs org-mode', and 'rmarkdown' input files and their 'pdf' output files. Examples for 'HTML' include 'org-mode' and 'Rmd' input files and their webarchive 'HTML' output files. In addition, the `as.orgtable()` function can display a `data.frame` in an 'org-mode' document. The examples for 'MS Word' (with either `filetype="docx"` or `filetype="html"`) work with all operating systems. The package does not require the installation of 'LaTeX' or 'MS Word' to be able to write '.tex' or '.docx' files.

**Imports** Hmisc (>= 4.1-1), HH, lattice, grid, flextable (>= 0.5-11),  
officer, ggplot2, htmltools, cowplot

**Suggests** reshape2, latticeExtra, xtable, markdown, rmarkdown, knitr,  
htmlTable

**License** GPL (>= 2)

**NeedsCompilation** no

**Repository** CRAN

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microplot-package	<i>Display microplots (sparklines) from R graphics panels in tables in 'LaTeX', 'Word', 'HTML', 'Excel'.</i>
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## Description

The microplot function writes a set of R graphics files to be used as microplots (sparklines) in tables in either 'LaTeX', 'HTML', 'Word', or 'Excel' files. For 'LaTeX', we provide methods for the Hmisc::latex() generic function to construct 'latex' tabular environments which include the graphs. These can be used directly with the operating system 'pdflatex' or 'latex' command, or by using one of 'Sweave', 'knitr', 'rmarkdown', or 'Emacs org-mode' as an intermediary. For 'MS Word',

the `msWord()` function uses the 'flextable' package to construct 'Word' tables which include the graphs. There are several distinct approaches for constructing HTML files. The simplest is to use the `msWord()` function with argument `filetype="html"`. Alternatively, use either 'Emacs org-mode' or the `htmlTable::htmlTable()` function to construct an 'HTML' file containing tables which include the graphs. See the documentation for our `as.htmlimg()` function. For 'Excel' use on 'Windows', the file `examples/irisExcel.xls` includes 'VBA' code which brings the individual panels into individual cells in the spreadsheet. Examples in the `examples` and `demo` subdirectories are shown with 'lattice' graphics, 'ggplot2' graphics, and 'base' graphics. Examples for 'LaTeX' include 'Sweave' (both 'LaTeX'-style and 'Noweb'-style), 'knitr', 'emacs org-mode', and 'markdown' input files and their 'pdf' output files. Examples for 'HTML' include 'org-mode' and 'Rmd' input files and their webarchive 'HTML' output files. In addition, the `as.orgtable()` function can display a `data.frame` in an 'org-mode' document. The examples for 'MS Word' (with either `filetype="docx"` or `filetype="html"`) work with all operating systems. The package does not require the installation of 'LaTeX' or 'MS Word' to be able to write '.tex' or '.docx' files.

## Details

The DESCRIPTION file:

```
Package:      microplot
Type:         Package
Title:        Microplots (Sparklines) in 'LaTeX', 'Word', 'HTML', 'Excel'
Version:      1.0-45
Date:         2022-01-26
Author:       Richard M. Heiberger, with contributions from Karen Byron and Nooreen Dabbish.
Maintainer:   Richard M. Heiberger <rmh@temple.edu>
Description:  The microplot function writes a set of R graphics files to be used as microplots (sparklines) in tables in either '
Imports:      Hmisc (>= 4.1-1), HH, lattice, grid, flextable (>= 0.5-11), officer, ggplot2, htmltools, cowplot
Suggests:    reshape2, latticeExtra, xtable, markdown, rmarkdown, knitr, htmlTable
License:      GPL (>= 2)
```

Index of help topics:

<code>LegendrePolyMatrices</code>	Legendre Orthogonal Polynomials for various values of alpha and beta. The dataset is used in the <code>demo("LegendrePolynomials")</code> .
<code>as.htmlimg</code>	Place a filename or filepath in the format used by HTML
<code>as.includegraphics</code>	Convert a filename into a complete 'LaTeX' '\includegraphics' expression for use with 'LaTeX' '\includegraphics' macro in the 'graphicx' package. This is used for 'pdf' and 'png' files with the system 'pdflatex' command. This is used for 'ps' files with the system 'latex' command.
<code>as.orgfile</code>	Place a filename or filepath in the format used by org-mode
<code>as.orgtable</code>	Prepare a matrix or <code>data.frame</code> to be used as an

	org-mode table
cc176.y.adj	Adjusted response values and their five number summaries by treatment level for one model using the cc176 dataset. This dataset is used in two demos: "bwplot" and "boxplot-ggplot".
dir.verify	Verifies existence of, or creates, a directory.
formatDF	Format a Data Frame or Matrix for LaTeX or HTML.
graphicsList	Convert a list of "trellis" objects or list of "ggplot" objects into a "graphicslist" object.
latex.AEdotplot	Display the AE (Adverse Events) dotplot of incidence and relative risk from the HH package in a 'LaTeX' tabular environment or in an 'MS Word' or an 'HTML' table.
latex.trellis	Display a table in 'latex' containing panels from R graphs in its cells.
latexSetOptions	Set the options for use of latex; check whether the options for latex functions have been specified.
layoutCollapse	Set the lattice 'par.settings' to remove all marginal space.
microplot	Take a trellis or ggplot object, or graphicsList object (list of trellis or ggplot objects), and generate a set of graphics files, one per panel of a multi-panel display.
microplot-package	Display microplots (sparklines) from R graphics panels in tables in 'LaTeX', 'Word', 'HTML', 'Excel'.
microplotAttrDisplay	Specify how to display the microplots for x.axis, y.axis, xlab, ylab, and key.
msWord	Display a table in 'MS Word' containing panels from R graphs in its cells.
show.latexConsole	Revisions of Hmisc latex and dvi functions that display the generated latex file on screen and divert the console log to a file. New print methods that display Operating System files (ps, docx, html) on screen.
theme_collapse	Set the 'ggplot2' theme to remove all marginal space.
toxicity	Simulated toxicity data. Dataset is used in demo("tablesPlusGraphicColumn").

Microplots are small plots that fit into the cells of a table that otherwise consists of text and numbers. A special case of a microplot is known as a sparkline.

The examples in this package show tables of simple or complex graphs placed into one or more columns of a table. The graphs can be produced by any graphical system in 'R'. We show **lattice**, **ggplot2**, and **base** graphics. The tables can be targeted for display in 'LaTeX', 'MS Word' on any operating system, 'MS Excel' on 'Windows', or 'HTML'. We show examples of each.

The functions produce valid 'LaTeX' .tex files or 'Word' .docx files in the working directory. If 'LaTeX' or 'Word' are installed, then the generated files can be displayed on screen as illustrated in the help file examples and the demo directory. The .tex files can be \included in a larger .tex file. Or the generated .pdf file can be displayed in 'LaTeX' with an \includegraphics statement. The images in the displayed .docx file can be copied and pasted into a larger 'Word' file.

The best way to learn this package is to read the examples and demo files. The primary function `microplot` takes a trellis or ggplot object and generates a set of graphics files, one per panel of a multi-panel display. The `latex` and `msWord` functions place the graphics files into a table.

The `latex` examples (in the help file examples) and demo files use the operating system `pdflatex` command with the 'R' `pdf()` or `png()` graphics device. Or they could use the operating system `latex` command with the 'R' `ps()` graphics device. They therefore require that the three options `options()[c("latexcmd", "dviExtension", "xdvicmd")]` all be set consistently. The recommended settings for `pdflatex` with pdf graphics files are included as the defaults in the function call

```
latexSetOptions()
```

The recommended settings for `latex` with ps graphics files may be specified with the function call `latexSetOptions("latex")`

Please see `latexSetOptions` for details on the recommended settings for use with the **microplot** package. See the "System options" section in the "Details" section of `latex` for discussion of the options themselves.

The examples in this help file are inside `dontrun` environments because they depend on options and they write files. You must set the options for your system before running the example manually.

Most of the 'LaTeX' examples are shown using the `Hmisc::latex` function `latex` (I am coauthor of that function). The **microplot** package also works with the `xtable::xtable` function `xtable`. An example in the demo directory shows a simple use of `xtable`.

The demos in the demo directory are not inside a `dontrun` environment. You must set the options for your system before running them. Each demo sets the options for `pdflatex`. Should you prefer `latex` you will need to run the demos manually. I recommend that you run the demos with `ask=TRUE` because will need to read them closely to see what they are doing.

To run the demos manually (with a stop at each graph), use

```
demo("HowToUseMicroplot"      , package="microplot", ask=TRUE)
demo("latex"                  , package="microplot", ask=TRUE)
demo("latex-ggplot"           , package="microplot", ask=TRUE)
demo("msWord"                 , package="microplot", ask=TRUE)
demo("LegendrePolynomials"    , package="microplot", ask=TRUE)
demo("timeseries"             , package="microplot", ask=TRUE)
demo("NTplot"                 , package="microplot", ask=TRUE)
demo("bwplot-lattice"         , package="microplot", ask=TRUE)
demo("boxplot-ggplot"         , package="microplot", ask=TRUE)
demo("tablesPlusGraphicColumn", package="microplot", ask=TRUE)
demo("regcoef"                , package="microplot", ask=TRUE)
demo("iris"                   , package="microplot", ask=TRUE)
demo("AEdotplot"              , package="microplot", ask=TRUE)
```

```
demo("xtable"                , package="microplot", ask=TRUE)
demo("Examples"              , package="microplot", ask=TRUE)
```

To run the demos automatically, with no stops, use ask=FALSE.

The examples directory `system.file(package="microplot", "examples")` includes complete working examples of **Sweave** (both LaTeX-style and Noweb-style), **knitr**, emacs **orgmode**, and **rmarkdown** input files and their pdf output files. These files must be copied into a directory in which you have write privilege, and that directory must be made the current working directory with `setwd`. They will not work from the installed package directory.

The 'Excel' for Windows example is in file `examples/irisExcel.xls`. The 'VBA' code in that file shows how to place the individual microplots into 'Excel' cells.

See also the vignette:

```
vignette("rmhPoster", package="microplot")
```

### Author(s)

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Maintainer: Richard M. Heiberger <rmh@temple.edu>

### See Also

[latex](#), [latex.trellis](#), [microplot](#), [as.includegraphics](#)

### Examples

```
## This example writes a set of pdf files and then uses the latex
## function to display them in LaTeX.

## The graphs are constructed three times, once each with lattice,
## base graphics, and ggplot2.

## Not run:

## 0. set options for pdflatex and pdf graphics files
latexSetOptions()

## 1. define dataset
tmp <- matrix(rnorm(10), 2, 5, byrow=TRUE,
             dimnames=list(c("A", "B"), paste0("X", 1:5)))

tmp.df <- data.frame(y=as.vector(t(tmp)),
                   group=factor(rep(row.names(tmp), each=5)))
tmp.df

## 2. lattice example for latex and msWord

tmp.lattice <- lattice::bwplot(group ~ y | " " * group, data=tmp.df, layout=c(1,2),
```

```

as.table=TRUE, xlim=c(-2.1, 1.3),
scales=list(y=list(relation="free", at=NULL)))

tmp.lattice

## 3. using the latex.trellis method
latex(tmp.lattice,
      height.panel=.3, width.panel=3, ## inches
      x.axis=TRUE, y.axis=FALSE,
      rowlabel="group", caption="latex.trellis of lattice graph column")

latex(tmp.lattice, dataobject=formatDF(tmp, dec=2),
      height.panel=.3, width.panel=1.5, ## inches
      x.axis=FALSE, y.axis=FALSE,
      rowlabel="group", caption="latex.trellis of numeric data and lattice graph column")

## 4. MS Word example. Uses functions in the flextable and officer packages.

tmp1w.docx <-
  msWord(tmp.lattice, dataobject=format(tmp, digits=2),
        height.panel=.3, width.panel=2, ## inches
        height.x.axis=.35, width.y.axis=.3,
        figPrefix="tmp1w",
        y.axis=FALSE,
        rowlabel="group", width.rowname=.6,
        data.header="data values", width.dataobject=.6,
        graph.header="bwplot",
        caption="Lattice bwplot using msWord function")
print.default(tmp1w.docx)
tmp1w.docx ## print method opens file
## cut and paste this graph into a larger .docx file.

## 5. ggplot2 example for latex and msWord

library(ggplot2)

tmpga.df <- cbind(tmp.df, fake="ff")
tmpga <-
  ggplot(tmpga.df, aes(fake, y)) +
  geom_boxplot(outlier.size = 2) +
  facet_wrap(~ group, ncol=1) +
  coord_flip() + ylim(-2, 1.1)
tmpga ## on interactive device

## 6. using the latex.ggplot method

latex(tmpga, height.x.axis=.2, width.y.axis=.2, y.axis=FALSE)

latex(tmpga, dataobject=formatDF(tmp, dec=2),
      height.panel=.5, height.x.axis=.2, width.y.axis=.2, y.axis=FALSE)

```

```

## 7. msWord with ggplot

tmpga.docx <-
  msWord(tmpga, dataobject=format(tmp, digits=2),
        height.panel=.25, height.x.axis=.2, width.y.axis=.2, y.axis=FALSE,
        rowlabel="group", width.rowname=.6,
        data.header="data values", width.dataobject=.6,
        graph.header="bwplot",
        caption="ggplot2 boxplot using msWord function")
print.default(tmpga.docx)
tmpga.docx ## print method opens file

detach("package:ggplot2")

## 8. base graphics example
## This must be done with an explicit loop because
## base graphics doesn't produce a graphics object.

dir.verify("tmpb")
pdf("tmpb/fig%03d.pdf", onefile=FALSE, height=.5, width=3) ## inch
par( bty="n", xaxt="n", omd=c(0,1, 0,1), mai=c(0,0,0,0))
boxplot(tmp["A",], horizontal=TRUE, ylim=range(tmp)) ## ylim for horizontal plot
boxplot(tmp["B",], horizontal=TRUE, ylim=range(tmp)) ## ylim for horizontal plot
dev.off()

tmpb.graphnames <- paste0("tmpb/fig", sprintf("%03i", 1:2), ".pdf")

tmpb.display <-
  data.frame(round(tmp, 2),
            graphs=as.includegraphics(tmpb.graphnames, height="2em", raise="-1.4ex"))
tmpb.display

## we are now using the latex.data.frame method in the Hmisc package
tmpb.latex <- latex(tmpb.display, rowlabel="group",
                  caption="latex.default of base graphs")
tmpb.latex$style <- "graphicx"
tmpb.latex ## this line requires latex in the PATH

## 9. detail for latex of lattice. This is essentially what the
## latex.trellis method does all together.

dir.verify("tmp1") ## create a new subdirectory of the working directory
pdf("tmp1/fig%03d.pdf", onefile=FALSE, height=.5, width=2.5) ## inch
update(tmp.lattice, layout=c(1,1), xlab="",
      par.settings=list(layout.heights=layoutHeightsCollapse(),
                        layout.widths=layoutWidthsCollapse(),
                        axis.line=list(col="transparent"),
                        strip.border=list(col="transparent")))

```



```

dev.off()

tmpl.graphnames <- paste0("tmpl/fig", sprintf("%03i", 1:2), ".pdf")
names(tmpl.graphnames) <- rownames(tmp)

tmpl <-
  as.includegraphics(tmpl.graphnames)
## retains dimensions from pdf() statement
tmpl
tmpl.latex <- latex(tmpl, rowlabel="group",
                   caption="latex.default of lattice graph column")
tmpl.latex ## this line requires latex in the PATH

tmplw <-
  data.frame(round(tmp, 2),
             graphs=as.includegraphics(tmpl.graphnames, width="1in"))
## retains aspect ratio from pdf() statement
tmplw

tmplw.latex <- latex(tmplw, rowlabel="group",
                   caption="latex.default of numeric data and lattice graph column")
tmplw.latex$style <- "graphicx"
tmplw.latex ## this line requires latex in the PATH

## 10. detail for latex of ggplot.
## left as an exercise. It is very similar to the detail for latex with lattice.

## End(Not run)

## Please see the demos for more interesting examples.
## demo(package="microplot")

```

---

as.htmlimg

*Place a filename or filepath in the format used by HTML*


---

## Description

Place a filename or filepath in the format used by HTML, by surrounding it with "`<img src`" and "`>/>`" and with possible additional arguments between.

## Usage

```
as.htmlimg(object, height = "80", width = NULL, wd = getwd(), align = "middle")
```

**Arguments**

object	Vector of character strings containing filenames.
height, width	Number of pixels as a character string.
wd	The directory in which the files reside. The default is the current working directory that R is using.
align	Specifies the alignment of an image according to surrounding elements (Not supported in HTML5). One of the strings: "top", "bottom", "middle", "left", "right"

**Value**

A character vector containing the input strings surrounded by "<img src" and "/>" and with possible additional arguments between.

**Author(s)**

Nooreen Dabbish <nerd@temple.edu> and Richard M. Heiberger <rmh@temple.edu>

**See Also**

[microplot](#)

**Examples**

```
as.htmlimg("abcd.png")
as.htmlimg("abcd.png", wd=".")
as.htmlimg(c("abcd.png", "efgh.png"))
cat( as.htmlimg("abcd.png")           , "\n")
cat( as.htmlimg("abcd.png", wd=".")   , "\n")
cat( paste(as.htmlimg(c("abcd.png", "efgh.png")), "\n"))

## For an example in context, please see the package example:
##   system.file(package="microplot", "examples/irisRMarkdownHtml.Rmd")
## Copy file irisRMarkdownHtml.Rmd to a directory in which you have write privileges.
## Run the statement
##   rmarkdown::render("irisRMarkdownHtml.Rmd", output_file="irisRMarkdownHtml.html")
## at the R Console.
```

---

as.includegraphics     *Convert a filename into a complete 'LaTeX' \includegraphics expression for use with 'LaTeX' \includegraphics macro in the **graphicx** package. This is used for pdf and png files with the system pdflatex command. This is used for ps files with the system latex command.*

---

## Description

Convert a filename into a complete 'LaTeX' `\includegraphics` expression for use with 'LaTeX' `\includegraphics` macro in the **graphicx** package. This is used for pdf and png files with the system `pdflatex` command. This is used for ps files with the system `latex` command. The argument `wd` is included in the pathname in the generated expression. The `\includegraphics` macro is generated with the height and optional width specified by the `height.includegraphics` and `width.includegraphics` arguments; the default NULL means use the values in the `graphics` (pdf, png, ps) files. If either is specified, the other should be left as NULL to retain the original aspect ratio. ## An optional raise value is available for vertical alignment. An optional trim argument is available to remove excess margins from the image. See the Details section for use of the trim argument to trim panels in an externally produced graphics file.

## Usage

```
as.includegraphics(object, ...)
```

```
## Default S3 method:
```

```
as.includegraphics(object,
  height.includegraphics=NULL, ## LaTeX measurement (character)
  width.includegraphics=NULL, ## retains original aspect ratio,
  ##                               LaTeX measurement (character)
  scale=NULL, ## number
  raise=NULL, ## LaTeX measurement (character)
  tabularinclude=TRUE,
  hspace.left=NULL, ## LaTeX measurement (character)
  hspace.right=NULL, ## LaTeX measurement (character)
  wd=getwd(), ## working directory. No embedded spaces in directory name.
  viewport=NULL, ## if specified, then left bottom right top (character)
  ## used for pdf png jpeg
  ## See MediaBox in pdf file.
  ## Ask operating system for png or jpg file.
  bb=NULL, ## if specified, then left bottom right top (character)
  ## used for bmp tiff ps, ask operating system for values
  trim=NULL, ## for example, "0 0 0 0" left bottom right top (character)
  x.axis.includegraphics=TRUE, ## logical or a list of arguments
  ##                               to latex \includegraphics[here]{}
  y.axis.includegraphics=TRUE, ## logical or a list of arguments
  xlab.includegraphics=FALSE, ## logical or a list of arguments
  ylab.includegraphics=FALSE, ## logical or a list of arguments
  key.includegraphics=!is.null(attr(object, "key.name")),
  ##                               ## logical or a list of arguments
  as.attr=FALSE, ## logical
  label.x.axis="", ## empty, nchar=0
  label.y.axis=" ", ## one space, nchar=1
  columnKey=NULL, ## see ?microplotAttrDisplay
  ...)
```

```
## S3 method for class 'microplotMatrix'
```

```

as.includegraphics(object, ...) ## principal usage. Calls default.

## S3 method for class 'includegraphicsMatrix'
as.includegraphics(object, ...) ## returns object

## S3 method for class 'trellis'
as.includegraphics(object, ...) ## generates an informative error message.

## S3 method for class 'ggplot'
as.includegraphics(object, ...) ## generates an informative error message.

## S3 method for class 'graphicsList'
as.includegraphics(object, ...) ## generates an informative error message.

```

## Arguments

object	A "microplotMatrix", that is a character vector or matrix of filenames for graphics files. The argument may include attributes <code>axis.names</code> , <code>lab.names</code> , and <code>key.name</code> for graphics files containing the "x.axis", "y.axis", "xlab", "ylab", and "key" (legend) panels.
scale	Scale factor (number) applied to figure. If either <code>height.includegraphics</code> or <code>width.includegraphics</code> is specified, then scale is ignored.
<code>height.includegraphics</code> , <code>width.includegraphics</code>	Character vector containing a LaTeX distance (by default NULL). Specifying at most one of these retains the original aspect ratio. Specifying a value for both might distort the figure by changing the aspect ratio. Specifying <code>trim</code> on height of a panel requires a new height to be specified to retain the aspect ratio. Specifying <code>trim</code> on width of a panel requires a new width to be specified to retain the aspect ratio. See <code>demo("latex")</code> and <code>demo("latex-ggplot")</code> for an example.
wd	The directory in which the files reside. The default is the full path to the current working directory that R is using. The full path is necessary when using the <code>Hmisc::print.latex</code> and related functions because they run the operating system's <code>latex</code> or <code>pdflatex</code> command in a temporary directory. The relative path to the current directory ( <code>wd="."</code> ) is sufficient if the file will be brought into a larger <code>tex</code> file with the LaTeX <code>\input</code> macro. Should the working directory have an embedded blank anywhere in its pathname, then <code>as.includegraphics</code> will generate an informative error. This is to protect you from a less-informative error that the system <code>'latex'</code> command would otherwise generate. The recommended repair is to <code>setwd()</code> to a directory whose path has no embedded blanks anywhere. A workaround is to use <code>wd="."</code> in the <code>latex</code> call. Automatic printing with <code>Hmisc::print.latex</code> will not work. <code>\input{}</code> of the generated <code>.tex</code> file into your larger <code>.tex</code> will work. Moving the generated <code>.tex</code> file in the temporary directory to your working directory will work.
raise	Character vector containing a LaTeX distance (by default NULL). This value may be negative. Use it if the default vertical alignment of the graphs in the table is

	not satisfactory. Usually a better approach would be to use the <code>arraystretch</code> argument to <code>latex.trellis</code> .
<code>tabularinclude</code>	Logical. When TRUE place the generated <code>\includegraphics{}</code> statements inside a <code>tabular</code> environment. This makes the center of the included graphic align with the text on the same line of the <code>tabular</code> environment.
<code>hspace.left</code> , <code>hspace.right</code>	Character vector containing a LaTeX distance (by default NULL). This value may be negative. Use it if the default distance on the left or right between columns of graphs in the table is not satisfactory.
<code>viewport</code>	Size in pixels of the image file. This is the <code>MediaBox</code> in a pdf file. It is the number reported by the operating system for a png file. The <code>viewport</code> is optional. When specified it must be a character string containing four numbers in order: left, bottom, right, top.
<code>bb</code>	Bounding Box: Size in pixels of the image file. It is the number reported by the operating system for a ps file. When specified it must be a character string containing four numbers in order: left, bottom, right, top.
<code>trim</code>	Size in pixels to be trimmed. It must be a character string containing four numbers in order: left, bottom, right, top. See the manual for the LaTeX package <b>graphicx</b> for details. When <code>trim</code> is used, either <code>height.includegraphics</code> or <code>width.includegraphics</code> will also need to be changed. See <code>demo("latex")</code> and <code>demo("latex-ggplot")</code> for an example. See the Details section for additional use of the <code>trim</code> argument.
<code>x.axis.includegraphics</code> , <code>y.axis.includegraphics</code>	logical, or list of arguments to nested calls to <code>as.includegraphics</code> .
<code>xlab.includegraphics</code> , <code>ylab.includegraphics</code> , <code>key.includegraphics</code>	logical, or list of arguments to nested calls to <code>as.includegraphics</code> .
<code>as.attr</code>	Logical. When TRUE the attributes in the <code>"microplotMatrix"</code> argument become attributes in the <code>"includegraphicsMatrix"</code> result. When FALSE, the <code>label.x.axis</code> , <code>label.y.axis</code> , and <code>columnKey</code> arguments are passed through to <code>microplotAttrDisplay</code> .
<code>label.x.axis</code> , <code>label.y.axis</code>	Labels that will be used by <code>microplotAttrDisplay</code> in the column name of the <code>y.axis</code> and the <code>y.axis</code> position for the <code>x.axis</code> in the 'latex' display of the graphic.
<code>columnKey</code>	If <code>as.attr</code> is FALSE and the key in <code>attr(object, "key.name")</code> is non-null, then <code>microplotAttrDisplay</code> will place its <code>key.name</code> as a new last value in the specified columns. The column numbering is with respect to the input object, before the <code>y.axis</code> or <code>ylab</code> are evaluated.
<code>...</code>	Other arguments currently ignored.

## Details

We recommend that the aspect ratio be controlled by the 'R' functions that generated the figure. `as.includegraphics` will use the height and width values that are encoded in the pdf, png, ps files. If you need to change the size of the image we recommend that at most one of

height.includegraphics and width.includegraphics be used in as.includegraphics. Using both will change the aspect ratio and consequently stretch the figure. The trim argument is used to remove excess margins from the figure; when trim is specified for height or width, the height.includegraphics or width.includegraphics will also need to be specified to retain the aspect ratio. See demo("latex") and demo("latex-ggplot") for an example.

Either the viewport (for pdf or png files) or bb (for ps files) should be specified, not both.

The trim argument can be used to take apart an externally produced graphics file and use subsets of its area as components in a 'LaTeX' table. See the files examples/irisSweaveTakeApart.Rtex and examples/irisSweaveTakeApart-Distributed.pdf for an example.

### Value

A "includegraphicsMatrix" object, a vector or matrix of 'LaTeX' expressions with the 'LaTeX' macro \includegraphics for each of the input filenames. If the input argument has axis.names or lab.names or key.name attributes, then the value will also have those attributes, enclosed in \includegraphics statements. The arguments allow different \includegraphics options for the panels, the x.axis, the y.axis, xlab, ylab, and the key (legend). The location of the files listed in the input argument attributes depends on the value of the as.attr argument. When as.attr is TRUE the object attributes will become result attributes. When as.attr is FALSE, see the [microplotAttrDisplay](#) for details.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

### See Also

[latex.trellis](#), [microplot](#), [latex](#)

### Examples

```
as.includegraphics("abc.pdf")
## [1] "\setlength{\tabcolsep}{0pt}\begin{tabular}{c}
##      \includegraphics{/Users/rmh/Rwd/abc.def}\end{tabular}"
## attr(,"class")
## [1] "includegraphicsMatrix" "character"
## This form, with the full pathname, is required when the Hmisc::print.latex
## and related functions are used for automatic display of
## the current .tex file on screen.

as.includegraphics("abc.pdf", wd=".")
## [1] "\setlength{\tabcolsep}{0pt}\begin{tabular}{c}
##      \includegraphics{./abc.pdf}\end{tabular}"
## attr(,"class")
## [1] "includegraphicsMatrix" "character"
## This form, with the relative path, is optional when the .tex file will be
## embedded into a larger file, and will not be automatically displayed on screen.

## Please see the package documentation ?microplot for a simple example in context.
```

```
## Please see the demos for more interesting examples.
## demo(package="microplot")
```

---

as.orgfile

*Place a filename or filepath in the format used by org-mode*


---

## Description

Place a filename or filepath in the format used by org-mode, by surrounding it with "[[" and "]]".

## Usage

```
as.orgfile(object, wd = getwd(), ...)
```

## Arguments

object	Vector of character strings containing filenames.
wd	The directory in which the files reside. The default is the current working directory that R is using.
...	Ignored.

## Value

A character vector containing the input strings surrounded by "[[" and "]]".

## Author(s)

Nooreen Dabbish <nerd@temple.edu> and Richard M. Heiberger <rmh@temple.edu>

## See Also

[microplot](#)

## Examples

```
as.orgfile("abcd.png")
as.orgfile("abcd.png", wd=".")
as.orgfile(c("abcd.png", "efgh.png"))

## For an example in context, please see the package example:
##   system.file(package="microplot", "examples/irisOrgHtml.org")
## Copy file irisOrgHtml.org to a directory in which you have write privileges,
## open it in emacs, and enter
## C-c C-e b           on Macintosh
## C-c C-e ho          on Windows
## C-c C-e <something> on linux
```

---

as.orgtable

*Prepare a matrix or data.frame to be used as an org-mode table*


---

**Description**

Prepare a matrix or data.frame to be used as an org-mode table. Column names are required. Row names are optional (and default to FALSE)

**Usage**

```
as.orgtable(x, rownames = FALSE)
```

**Arguments**

x	Matrix or data.frame.
rownames	Logical. When FALSE (the default), the row.names are not displayed in the value. When TRUE, the row.names are displayed in the value. See the last example for details on this behavior.

**Value**

Vector of character strings, one item for each row of the argument x. The strings contain the markup that will make them appear as tables in an org-mode document.

**Author(s)**

Nooreen Dabbish <nerd@temple.edu> and Richard M. Heiberger <rmh@temple.edu>

**See Also**

[microplot](#)

**Examples**

```
tmp <- matrix(1:12, 3, 4, dimnames=list(letters[1:3], LETTERS[4:7]))
tmp
as.orgtable(tmp)
as.orgtable(tmp, rownames=TRUE)

tmpdf <- data.frame(tmp)
tmpdf
cat(as.orgtable(tmpdf), sep="\n")
cat(as.orgtable(tmpdf, rownames=TRUE), sep="\n")

## This example shows why row names default to FALSE.

tmp2 <- rbind(tmp, tmp)
tmp2
tmp2df <- data.frame(tmp2)
```



```

tmp2df

tmp2df <- cbind(" " = row.names(tmp2), group = rep(c("A", "B"), each = 3), tmp2df)
tmp2df

cat(as.orgtable(tmp2df), sep = "\n") ## this is what we want

## this has the unwanted initial column of 1:6
cat(as.orgtable(tmp2df, rownames = TRUE), sep = "\n")

```

cc176.y.adj

*Adjusted response values and their five number summaries by treatment level for one model using the cc176 dataset. This dataset is used in two demos: "bwplot" and "boxplot-ggplot".*

## Description

Adjusted response values and their five number summaries by treatment level for one model using the cc176 dataset. The five number summary is based on the standard deviation. This data set is used in two **microplot** demos:

```

demo("bwplot", package = "microplot")
demo("boxplot-ggplot", package = "microplot").

```

In both demos we reproduce HH2 (Heiberger and Holland (2015)) Table 13.2 (page 431), consisting of a table and aligned boxplot, twice—using the 'LaTeX' tabular environment accessed through the `latex` and `microplot` functions, and using an 'MS Word' table accessed through the `msWord` and `microplot` functions. In the book we used manual alignment in the 'LaTeX' code to construct the table (see chunk 6 in the file referenced by `HH: :HHscriptnames(13)` for the code).

## Usage

```
data("cc176.y.adj")
```

## Author(s)

Richard M. Heiberger <rmh@temple.edu>

## References

Heiberger, Richard M. and Holland, Burt (2015). *Statistical Analysis and Data Display: An Intermediate Course with Examples in R*, Second Edition. Springer Texts in Statistics. Springer. ISBN 978-1-4939-2121-8. <https://link.springer.com/us/book/9781493921218>

## Examples

```

## Not run:
## This example is based on chunks 1, 2, 4, 6 of HH: :HHscriptnames(13)
## It defines the data(cc176.y.adj) that is used in
##   demo("bwplot-lattice") ## 5 calls to latex() and 5 calls to msWord()
##   demo("boxplot-ggplot") ## 2 calls to latex() and 3 calls to msWord()

```

```
data(cc176, package="HH")
cc176.aov <- aov(wt.d ~ rep + wt.n + n.treats*minutes*current,
               data=cc176)
cc176.y.adj <- cc176$wt.d -
  (cc176$wt.n - mean(cc176$wt.n))*coef(cc176.aov)["wt.n"]

tmp <-
sapply(split(cc176.y.adj, cc176$current),
       function(x)
         c(min=min(x),
           "m-sd"=mean(x)-sd(x),
           mean=mean(x),
           "m+sd"=mean(x)+sd(x),
           max=max(x)))
cc176fivenumsd <- t(tmp)

save(cc176.y.adj, cc176fivenumsd, file="cc176.y.adj.rda")

## End(Not run)
```

---

dir.verify

*Verifies existence of, or creates, a directory.*

---

### Description

Verifies existence of, or creates, a directory.

### Usage

```
dir.verify(path)
```

### Arguments

path            A character vector containing a single path name. See [dir.exists](#) for more detail.

### Value

Logical. TRUE if the directory already exists or is newly created.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

### See Also

[dir.exists](#)

---

formatDF	<i>Format a Data Frame or Matrix for LaTeX or HTML.</i>
----------	---

---

**Description**

Format a Data Frame or Matrix for LaTeX or HTML.

**Usage**

```
formatDF(...)  
## please see ?Hmisc::format.df
```

**Arguments**

... Please see [format.df](#) for details.

**Details**

Alias for the `Hmisc::format.df` function whose name will soon be deprecated.

**Value**

A character matrix with character images of properly rounded x. Please see [format.df](#) for details.

**Author(s)**

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---

graphicsList	<i>Convert a list of "trellis" objects or list of "ggplot" objects into a "graphicslist" object.</i>
--------------	--

---

**Description**

Convert a list of "trellis" objects or list of "ggplot" objects into a "graphicslist" object.

**Usage**

```
graphicsList(...)
```

**Arguments**

... The list can either be a "list" object, such as `list(g1,g2,g3)`, or the actual list `g1,g2,g3`. All the `g*` objects must be the same class, either "trellis" or "ggplot". The "list" object may be an array with `dim` or `dimnames`, with `length(dim(object))` either 1 or 2. An actual list, or a "list" object with one dimension, will be coerced to a column vector of graphics objects.

**Value**

A "graphicsList" object which can be sent to `microplot.graphicsList`. See [microplot.graphicsList](#) for more discussion.

**Author(s)**

Richard M. Heiberger <rmh@temple.edu>

**Examples**

```
## Not run:
  latexSetOptions()

## graphicsList works the same for lattice and ggplot

## lattice
tt <- data.frame(x=1:3, y=4:6, g=c("A","B","A"))

## t1 and t2: with key
t1 <- lattice::xyplot(y ~ x, xlim=c(0,4), ylim=c(3,7), groups=g,
  data=tt[1:2,], pch=19, col=2:3,
  key=list(points=list(pch=19, col=2:3), text=list(levels(tt$g))))

t2 <- lattice::xyplot(y ~ x, xlim=c(0,4), ylim=c(3,7), groups=g,
  data=tt[3, ], pch=19, col=2:3,
  key=list(points=list(pch=19, col=2:3), text=list(levels(tt$g))))

## collapsed panels, no key
latex(graphicsList(t1, t2), title="glt1", width.y.axis=.4, height.x.axis=.4)

## collapsed panels, one key
latex(graphicsList(t1, t2), key=t1$legend$top$args$key, title="glt2",
  width.y.axis=.4, height.x.axis=.4)

## uncollapsed panels, one key per panel
latex(graphicsList(list(t1, t2)), height.panel=2, width.panel=2, collapse=FALSE, title="glt1")

## uncollapsed panels, one key
latex(graphicsList(list(update(t1, legend=NULL),
  update(t2, legend=NULL))),
  height.panel=2, width.panel=2, collapse=FALSE,
  key=t1$legend$top$args$key, title="glt4")
```

```

## collapsed panels, no key
msWord(graphicsList(matrix(list(t1, t2), 2, 1, dimnames=list(c("A","B"), "c"))),
        width.rowname=.5, title="Wt1", width.y.axis=.4, height.x.axis=.4)

## collapsed panels, one key
msWord(graphicsList(matrix(list(t1, t2), 2, 1, dimnames=list(c("A","B"), "c"))),
        key=t1$legend$top$args$key,
        width.rowname=.5, title="Wt2", width.y.axis=.4, height.x.axis=.4)

## uncollapsed panels, one key per panel
msWord(graphicsList(matrix(list(t1, t2), 2, 1, dimnames=list(c("A","B"), "c"))),
        height.panel=2, width.panel=2, collapse=FALSE,
        width.rowname=.5, title="Wt3")

## uncollapsed panels, one key
msWord(graphicsList(matrix(list(update(t1, legend=NULL),
                                update(t2, legend=NULL)),
                                2, 1, dimnames=list(c("A","B"), "c"))),
        height.panel=2, width.panel=2, collapse=FALSE,
        key=t1$legend$top$args$key,
        width.rowname=.5, title="Wt4")

## ggplot
tt <- data.frame(x=1:3, y=4:6, g=c("A","B","A"))

library(ggplot2)

## g1 and g2: with key
g1 <-
  ggplot(tt[1:2,], aes(x,y, color=g)) +
  geom_point() +
  xlim(0,4) + ylim(3,7)

g2 <-
  ggplot(tt[3,], aes(x,y, color=g)) +
  geom_point() +
  xlim(0,4) + ylim(3,7)

g1key <- plot_grid(get_legend(g1))

## collapsed panels, no key
latex(graphicsList(g1, g2), title="glg1", width.y.axis=.2, height.x.axis=.2)

## collapsed panels, one key
latex(graphicsList(g1, g2), key=g1key, title="glg2", width.y.axis=.2, height.x.axis=.2)

## uncollapsed panels, one key per panel
latex(graphicsList(list(g1, g2)), height.panel=2, width.panel=2, collapse=FALSE, title="glg3")

## uncollapsed panels, one key
latex(graphicsList(list(g1+theme(legend.position="none")),

```

```

        g2+theme(legend.position="none"))),
    height.panel=2, width.panel=2, collapse=FALSE,
    key=g1key, title="glg4")

## collapsed panels, no key
msWord(graphicsList(g1, g2),
    width.rowname=.5, title="Wg1", width.y.axis=.4, ## width.y.axis=.2, ## not in R CMD check
    height.x.axis=.2,
    FlexTableWidths=c(.5, .45, 1))          ## c(.5, .25, 1)  ## not in R CMD check

## collapsed panels, one key                ## ditto
msWord(graphicsList(g1, g2), key=g1key,
    width.rowname=.5, title="Wg2", width.y.axis=.4,
    height.x.axis=.2,
    FlexTableWidths=c(.5, .45, 1))

## uncollapsed panels, one key per panel
msWord(graphicsList(list(g1, g2)), height.panel=2, width.panel=2, collapse=FALSE,
    width.rowname=.5, title="Wg3")

## uncollapsed panels, one key
msWord(graphicsList(list(g1+theme(legend.position="none"),
    g2+theme(legend.position="none"))),
    height.panel=2, width.panel=2, collapse=FALSE,
    key=g1key,
    width.rowname=.5, title="Wg4")

detach("package:ggplot2") ## can't unload

## End(Not run)

```

---

latex.AEdotplot

*Display the AE (Adverse Events) dotplot of incidence and relative risk from the HH package in a 'LaTeX' tabular environment or in an 'MS Word' or an 'HTML' table.*

---

## Description

The `AEdotplot` function constructs a display of the most frequently occurring AEs (Adverse Events) in the active arm of a clinical study. The `latex` method takes the incidence panel and the relative risk panel from the `AEdotplot` and places them in a 'LaTeX' tabular environment along with the numerical table of counts, percents, and relative risks. The `msWord` method takes the incidence panel and the relative risk panel from the `AEdotplot` and places them in an 'MS Word' table along with the numerical table of counts, percents, and relative risks.

## Usage

```
## S3 method for class 'AEdotplot'
latex(object, figPrefix = first.word(deparse(substitute(object))),
```

```

    rowlabel="Most Frequent On-Therapy Adverse Events",
    device="pdf", ...)

## S3 method for class 'AEdotplot'
msWord(object, figPrefix = first.word(deparse(substitute(object))),
        device="png",
        height.panel=.25, height.x.axis=.45,
        width.left=2, width.right=1.5,
        height.key=height.panel,
        width.dataobject=.7,
        rowlabel="Adverse Event", width.rowname=2,
        ...)

## S3 method for class 'AEdotplot'
microplot(object, figPrefix, width.left=2, width.right=1.5,
           height.panel=.2, height.x.axis=.45, ...)

```

### Arguments

object	An "AEdotplot" object as constructed by the <a href="#">AEdotplot</a> .
figPrefix	Beginning characters for names of the sequence of generated graphics files. The 'latex' macro <code>\includegraphics</code> requires that there be no "." in the filename basename. We replace all "." in the figPrefix by "-".
device	Forwarded to <code>microplot</code> .
width.left, width.right	<code>width.left</code> is <code>width.panel</code> for the Percent column and <code>width.right</code> is the <code>width.panel</code> for the Relative Risk column of the <code>AEdotplot</code> . See <a href="#">AEdotplot</a> and <a href="#">microplot</a> .
height.panel, height.x.axis, height.key	See <a href="#">microplot</a> .
width.dataobject, width.rowname	See <a href="#">msWord</a> .
rowlabel	See <a href="#">latex.trellis</a> or <a href="#">msWord</a> .
...	Additional arguments to <code>microplot.AEdotplot</code> are forwarded to the <code>microplot.trellis</code> method. Additional arguments to <code>latex.AEdotplot</code> are forwarded to <code>microplot.AEdotplot</code> and to <a href="#">latex</a> . Additional arguments to <a href="#">msWord.AEdotplot</a> are forwarded to <code>microplot.AEdotplot</code> and to <a href="#">msWord</a> .

### Details

The [microplot.AEdotplot](#) function does most of the work, taking apart the "AEdotplot" object and constructing from it the set of graphics files identified in a "microplotMatrix" object and collecting the numerical data into a data.frame. The "microplotMatrix" and the data.frame are returned.

The [latex](#) and [msWord](#) methods call the `microplot` method and then the `latex` or `msWord` generic. The `msWord` method has more arguments than the `latex` method because it doesn't pick up the height and width dimensions from the graphics (.png) files.

**Value**

For `latex.AEdotplot`, the "latex" object giving the pathname of the .tex file containing the 'LaTeX' tabular environment constructed by the `latex` function. For `msWord.AEdotplot`, the "msWordFilename" object giving the pathname of the .docx file containing the generated table constructed by the `msWord.microplotMatrix` function which in turn uses functions in the `flextable` package.

The `microplot.AEdotplot` method returns a list containing the "microplotMatrix" and the data.frame.

**Author(s)**

Richard M. Heiberger <rmh@temple.edu>

**See Also**

See `AEdotplot` and `latex` for details on the operation of the `latex` method.

**Examples**

```
## See
## demo("AEdotplot", package="microplot", ask=TRUE)
```

---

<code>latex.trellis</code>	<i>Display a table in 'latex' containing panels from R graphs in its cells.</i>
----------------------------	---

---

**Description**

Display a table in 'latex' containing panels from R graphs in its cells. `Hmisc::latex` methods for "trellis", "ggplot", "graphicsList", "microplotMatrix", and "includegraphicsMatrix" objects.

**Usage**

```
## S3 method for class 'graphicsClass'
latex( ## called by trellis, ggplot, graphicsList methods
  object,
  figPrefix=first.word(deparse(substitute(object))),
  title=figPrefix, ## subject to lazy evaluation
  ##
  ## microplot arguments
  device={
    latexcmd <- options()$latexcmd
    if (is.null(latexcmd))
      latexcmd <- "latex"
    switch(latexcmd,
      pdflatex="pdf",
      latex=,
      "postscript")
```



```
    },
    ... ## can include arguments to
    ## latex.graphicsClass,
    ## microplot,
    ## as.includegraphics,
    ## latex.includegraphicsMatrix,
    ## latex.default
  )

## S3 method for class 'trellis'
latex( ## calls latex.graphicsClass
  object=stop("trellis object is required", call. = FALSE),
  figPrefix=first.word(deparse(substitute(object))),
  title=figPrefix, ## subject to lazy evaluation
  ... ## can include arguments to
  ## latex.graphicsClass,
  ## microplot,
  ## as.includegraphics,
  ## latex.includegraphicsMatrix,
  ## latex.default
)

## S3 method for class 'ggplot'
latex( ## calls latex.graphicsClass
  object=stop("ggplot object is required", call. = FALSE),
  figPrefix=first.word(deparse(substitute(object))),
  title=figPrefix, ## subject to lazy evaluation
  ... ## can include arguments to
  ## latex.graphicsClass,
  ## microplot,
  ## as.includegraphics,
  ## latex.includegraphicsMatrix,
  ## latex.default
)

## S3 method for class 'graphicsList'
latex( ## calls latex.graphicsClass
  object=stop("graphicsList object is required", call. = FALSE),
  figPrefix=first.word(deparse(substitute(object))),
  title=figPrefix, ## subject to lazy evaluation
  ... ## can include arguments to
  ## latex.graphicsClass,
  ## microplot,
  ## as.includegraphics,
  ## latex.includegraphicsMatrix,
  ## latex.default
)
```

```
## S3 method for class 'includegraphicsMatrix'
latex(
  object,
  dataobject, data.first=TRUE,
  title=first.word(deparse(substitute(object))),
  microplotMatrix=NULL,
  arraystretch=1, ## The normal interrow space is multiplied by arraystretch,
  ##               so changing it from its default value of 1 to 1.5 makes
  ##               the rows 1.5 times farther apart.
  ##               Uses the latex.default argument 'insert.top'.
  bottom.hline.raise=NULL, ## character with latex unit, for example "-10ex"
  ##               arraystretch interferes with bottom.hline.raise
  ##               Pick arraystretch first.
  bottom=if (!is.null(attr(object, "key.name")))
    attr(object, "key.name"),
  col.just.object=rep("c", ncol(object)),
  col.just.dataobject=rep("r", ncol(dataobject)),
  n.cgroup=NULL, ## generated below if cgroup is specified in ... and n.cgroup is not
  ...) ## arguments to latex.default

## S3 method for class 'microplotMatrix'
latex(object,
  title=first.word(deparse(substitute(object))),
  ...) ## all ... arguments are forwarded to both
  ## as.includegraphics and latex.includegraphicsMatrix
```

## Arguments

object	<p>For <code>latex.trellis</code>, a "trellis" object, usually a multi-panel object.</p> <p>For <code>latex.ggplot</code>, a "ggplot" object, usually a multi-panel object.</p> <p>For <code>latex.graphicsList</code>, a "graphicsList" object, usually a list of single panel graphics objects. All items in the list must be trellis objects or all must be ggplot objects.</p> <p>For <code>latex.microplotMatrix</code>, a "microplotMatrix" object, the result of calling <code>microplot</code> on a "trellis" or "ggplot" object; a matrix of LaTeX file-names, possibly with <code>axis.names</code> or <code>lab.names</code> or <code>key.name</code> attributes.</p> <p>For <code>latex.includegraphicsMatrix</code>, a "includegraphicsMatrix" object, the result of calling <code>as.includegraphics</code> on a "microplotMatrix" object; a matrix of LaTeX <code>\includegraphics</code> expressions, possibly with <code>axis.names</code> or <code>lab.names</code> or <code>key.name</code> attributes.</p>
device	Function used to construct the graphics files. See <a href="#">microplot</a> .
dataobject	Numeric or character matrix (or <code>data.frame</code> ).

<code>data.first</code>	Logical. If TRUE, then output file will have dataobject columns first, then graphics object columns. If FALSE, then output file will have graphics object columns first, then dataobject columns.
<code>figPrefix</code>	See <code>microplot.trellis</code> . The 'latex' macro <code>\includegraphics</code> requires that there be no "." in the filename basename. We replace all "." in the <code>figPrefix</code> by "-".
<code>title</code>	Arguments to <code>Hmisc::latex</code> .
<code>microplotMatrix</code>	The <code>microplotMatrix</code> will be made an attribute of the resulting latex object.
<code>arraystretch</code>	The normal interrow space is multiplied by <code>arraystretch</code> , so changing it from its default value of 1 to 1.5 makes the rows 1.5 times farther apart. Uses the <code>latex.default</code> argument <code>insert.top</code> .
<code>bottom.hline.raise</code>	Character string with latex unit, for example "-10ex". <code>arraystretch</code> interacts with <code>bottom.hline.raise</code> . Pick <code>arraystretch</code> first.
<code>bottom</code>	default argument to <code>latex.default</code> 's <code>insert.bottom</code> argument.
<code>col.just.object</code> , <code>col.just.dataobject</code>	Column justification. See <code>formatDF</code> . The default centers graph panel columns and right justifies dataobject columns because it assumes the dataobject contains formatted (hence aligned) numerical data.
<code>n.cgroup</code>	See <code>latex</code> . When <code>cgroup</code> is specified it always appears in <code>...</code> <code>ncgroup</code> is an optional input here because we have enough information to generate it.
<code>...</code>	Arguments to <code>microplot.trellis</code> , <code>microplot.ggplot</code> , <code>as.includegraphics</code> , <code>latex.includegraphicsMatrix</code> , <code>latex.default</code> .

## Details

The explicit result is a "latex" object containing the name of a generated .tex file in the current directory. The file contains a latex `\tabular` environment holding a `\table`. The cells of the `\table` contain each of the filenames wrapped in an `\includegraphics` expression. To get the name of the created file, you must save the returned value from the "latex" function and display it with `print.default`.

The `print` method for "latex" objects wraps the generated file in a minimal complete latex file, runs that file through the system `pdflatex` or `latex` (depending on the value of `options("latexcmd")`) to create a pdf file (or dvi file, depending on the value of `options("dviExtension")`), and displays it on the screen. To get the name of the displayed file, you must explicitly use the `dvi` function on the "latex" object and save the otherwise invisible return value. If it is a pdf file it can be included with an `\includegraphics` expression into another .tex file for use with `pdflatex`. If it is a dvi file it can be converted with `dvips` to a .ps file and included with an `\includegraphics` expression into another .tex file for use with `latex`.

## Value

The value of these latex methods is a "latex" object containing two components.

`file` Pathname of the generated .tex file.

style "graphicx", indicating that the latex `\usepackage{graphicx}` is required

See `demo/HowToUseMicroplot.r` for a tutorial. See the demos in `demo/latex.r` and `demo/latex-ggplot.r` for an elaborate example.

When one of the ... arguments is `file=""`, the generated LaTeX code is printed to standard output. See the discussion of the file argument in [latex](#) to learn how to use this feature with Sweave.

Function `latex.includegraphicsMatrix` takes the output of `as.includegraphics` as its input and returns a "latex" object. If there is a `key.name` attribute, then it is forwarded to `latex.default` as the `insert.bottom` argument. The result has an attribute "includegraphicsMatrix" containing its argument object and an attribute "microplotMatrix" containing the "microplotMatrix" object from which the "includegraphicsMatrix" was constructed.

Function `latex.microplotMatrix` takes the output of `microplot` as its input and forwards it to `latex.includegraphicsMatrix`. All ... arguments are forwarded to `latex.includegraphicsMatrix`. The return value is a "latex" object.

Functions `latex.trellis` and `latex.ggplot` and `latex.graphicsList` take their input and forward it through `latex.graphicsClass` to `microplot` and then to `latex.microplotMatrix`.

The print method for "latex" objects, described in [dvi](#), is to display the latexed file on the screen at 5.5in wide by 7in tall. The dimensions can be changed by an explicit call to the `dvi` method with other dimensions, for example

```
dvi(latex(MyTrellisObject), height.panel=11, width.panel=8.5)
```

```
See an example in demo("latex", package="microplot", ask=TRUE)
```

The format of the screen display depends on three options described in [latexSetOptions](#) and [latex](#).

For pdf`latex` normally use:

```
latexSetOptions("pdflatex")
```

For `latex` normally use:

```
latexSetOptions("latex")
```

### Author(s)

Richard M. Heiberger <[rmh@temple.edu](mailto:rmh@temple.edu)>

### See Also

[latex](#), [microplot](#), [as.includegraphics](#)

### Examples

```
## See the examples in the help files, the demo files, and in the
## examples subdirectory.
```

```
## The example here shows how to locate the generated .tex file and the displayed .pdf file.
## The .tex file can be brought into a larger .tex file with an \include statement.
## The .pdf file can be brought into a larger .tex file with an \includegraphics statement.
```

```
## Not run:
## These are the settings for my machines
## Set options for Hmisc::latex
```

```

latexSetOptions()

mpgGraph <- lattice::xyplot(mpg ~ wt, group=factor(cyl), data=mtcars,
                           xlim=c(.8, 6.2), ylim=c(9,37),
                           pch=as.character(levels(factor(mtcars$cyl))), cex=2)
mpgGraph ## on your interactive device
mpgLatex <-
  latex(mpgGraph,
        height.panel=2, width.panel=3, ## inch. pick numbers that look right to you.
        height.x.axis=.37, width.y.axis=.44, ## inch. these require trial and error.
        height.xlab=.18, width.ylab=.27, ## inch. these require trial and error.
        rowname=NULL, ## suppress rownames, see ?latex
        colheads=FALSE) ## suppress colnames, see ?latex
print.default(mpgLatex) ## file is in your working directory
mpgPdf <- dvi(mpgLatex)
print.default(mpgPdf) ## File is in a temporary directory.
                        ## If Macintosh shows "///", replace by "/" before using.

mpgPdf

## End(Not run)
## Sweave users can bring the generated files directly into their
## document. See the discussion of the \code{file} argument in
## \code{\link[Hmisc]{latex}} to learn how to use this feature with
## Sweave.

```

---

latexSetOptions	<i>Set the options for use of latex; check whether the options for latex functions have been specified.</i>
-----------------	---

---

## Description

Set the options for use of latex; check whether the options for latex functions have been specified: if any of `options()[c("latexcmd", "dviExtension", "xdvicmd")]` are NULL, an error message is displayed.

## Usage

```

latexSetOptions(
  latexcmd=c("pdflatex", "latex"),
  dviExtension={
    if (is.null(latexcmd)) NULL
    else
      switch(latexcmd,
             pdflatex="pdf",
             latex="dvi")
  },
  xdvicmd={
    if (is.null(latexcmd)) NULL ## dvips is used, .ps in wd displayed
  }
)

```

```

else
  switch(latexcmd,
    pdflatex=if (nchar(Sys.which("open")))
      "open"      ## Macintosh, Windows, SMP linux
    else
      "xdg-open", ## ubuntu linux
    latex="dvips") ##
    ## dvips  Mac, Win: .ps in wd displayed
    ## xdvi   Mac: Quartz displays image borders
    ##        and waits until dismissed.
    ## xdvi   Windows: not on my machine.
    ## yap    Windows: dvi is displayed
    ## open   Mac: nothing happens
    ## open   Windows: yap displays dvi
  }
)

latexCheckOptions(...)

```

### Arguments

```

latexcmd, dviExtension, xdvicmd
    See latex.

...      Any arguments to latexCheckOptions are ignored.

```

### Details

These are my recommendations (the default when no arguments are specified) for pdflatex:

```

options(latexcmd="pdflatex") ## Macintosh, Windows, linux
options(dviExtension="pdf")  ## Macintosh, Windows, linux

if (nchar(Sys.which("open"))) {
  options(xdvicmd="open")    ## Macintosh, Windows, SMP linux
} else {
  options(xdvicmd="xdg-open") ## ubuntu linux
}

```

These are my recommendations for latex (and are the settings when only the first argument is set to "latex"):

```

options(latexcmd="latex")
options(dviExtension="dvi")
options(xdvicmd="dvips")

```

**Value**

For `latexSetOptions`, the invisible list of the options that were set by this command.

For `latexCheckOptions`, if any NULL options are detected, the error message is printed. If all three options have non-NULL values, NULL.

**Author(s)**

Richard M. Heiberger <rmh@temple.edu>

**See Also**

[latex](#)

**Examples**

```
## Not run:
  latexSetOptions() ## default
  latexSetOptions("pdflatex") ## same as default
  latexSetOptions("pdflatex", "pdf", "open") ## same as default on Macintosh, Windows, SMP Unix

  latexSetOptions("latex")
  latexSetOptions("latex", "dvi", "dvips") ## same as above

  latexSetOptions(NULL)
  latexSetOptions(NULL, NULL, NULL) ## same as above

## End(Not run)
```

---

layoutCollapse

*Set the lattice par.settings to remove all marginal space.*

---

**Description**

Set the lattice `par.settings` to remove all marginal space. By default `layoutHeightsCollapse` and `layoutWidthsCollapse` set everything in `layout.heights` or `layout.widths` to 0 except for `panel`. The user can specify values for all the standard items in either of those items.

`layoutCollapse` by default sets `layout=c(1,1)`, collapses to 0 all heights and widths except for `panel`, removes all labels and strip labels, and sets all axis lines to `col="transparent"`.

**Usage**

```
layoutCollapse(x,
              xlab="",
              ylab="",
              xlab.top=NULL,
              ylab.right=NULL,
              main=NULL,
```

```

sub=NULL,
strip=FALSE,
strip.left=FALSE,
layout.heights=layoutHeightsCollapse(),
layout.widths=layoutWidthsCollapse(),
strip.border=list(col="transparent"),
axis.line=list(col="transparent"),
layout=c(1,1),
...)
layoutHeightsCollapse(...)
layoutWidthsCollapse(...)

```

### Arguments

... For layoutCollapse any argument to [update.trellis](#).  
 For layoutHeightsCollapse any item name in [trellis.par.get\(\)](#)\$layout.heights.  
 For layoutWidthsCollapse any item name in [trellis.par.get\(\)](#)\$layout.widths.

x Any "trellis" object.

xlab, ylab, xlab.top, ylab.right, main, sub  
 Standard [xyplot](#) arguments.

strip, strip.left, strip.border, axis.line, layout  
 Standard [xyplot](#) arguments.

layout.heights, layout.widths  
 Arguments to [trellis.par.get](#).

### Details

When very small plots are placed inside a LaTeX tabular environment, it is often helpful to suppress margins, axes, labels, titles.

### Value

For layoutCollapse, a "trellis" object.

For layoutHeightsCollapse and layoutWidthsCollapse, a list which may be used as input to the `par.settings` argument in a lattice call.

### Author(s)

Richard M. Heiberger <[rmh@temple.edu](mailto:rmh@temple.edu)>

### Examples

```

## Not run:
lattice::trellis.par.get("layout.heights")
lattice::trellis.par.get("layout.widths")
layoutHeightsCollapse()

```



```

layoutWidthsCollapse()
layoutWidthsCollapse(axis.left=1)

A <- lattice::xyplot(Sepal.Length ~ Sepal.Width | Species, data=iris)

A                                ## one page with three panels

layoutCollapse(A) ## three pages with one unlabeled panel on each

layoutCollapse(A, ## one page with panels labeled by ylab
               layout=c(1,3),
               ylab=levels(iris$Species),
               layout.heights=list(axis.bottom=1),
               layout.widths=list(axis.left=1),
               axis.line=list(col="green"))

## End(Not run)

## Please see the package documentation for a simple example in context.

## Please see the demos for more interesting examples.
## demo(package="microplot")

```

---

LegendrePolyMatrices *Legendre Orthogonal Polynomials for various values of alpha and beta. The dataset is used in the demo("LegendrePolynomials").*

---

## Description

Legendre Orthogonal Polynomials for various values of alpha and beta. The dataset is used in the demo("LegendrePolynomials").

## Usage

```
data("LegendrePolyMatrices")
```

## Author(s)

Richard M. Heiberger <rmh@temple.edu>

## Examples

```

## Not run:
## dontrun is to avoid requiring the user to install the polynom and orthopolynom packages

## These matrices are used in the demo showing both latex and msWord tables
##   demo("LegendrePolynomials"      , package="microplot", ask=TRUE)

## Legendre Polynomials
if (require(orthopolynom)) {

```

```

LP.score <- function(alpha, beta, m = 4, B = 100) {
  x <- seq(1/B, 1 - 1/B, length = B)
  u <- stats::pbeta(x, alpha, beta)
  poly <- slegendre.polynomials(m, normalized=TRUE)
  data.frame(x=x, T=sapply(poly[-1], predict, u))
}

alphas <- c(.25, .5, 1)
betas <- c(.25, .5, 1, 2, 10)

## generate LegendrePolyMatrices
LegendrePolyMatrices <- matrix(list(), nrow=length(alphas), ncol=length(betas),
                               dimnames=list(alphas=alphas, betas=betas))
for (alpha in seq(along=alphas))
  for (beta in seq(along=betas))
    LegendrePolyMatrices[[alpha, beta]] <- LP.score(alphas[alpha], betas[beta])

save(LegendrePolyMatrices, file="LegendrePolyMatrices.rda")

detach("package:orthopolynom", unload=TRUE)
detach("package:polynom", unload=TRUE)
} else data(LegendrePolyMatrices)

## End(Not run)

```

---

microplot

*Take a trellis or ggplot object, or graphicsList object (list of trellis or ggplot objects), and generate a set of graphics files, one per panel of a multi-panel display.*

---

## Description

Take a trellis or ggplot object, or graphicsList object (list of trellis or ggplot objects), and generate a set of graphics files, one per panel of a multi-panel display. Additional files are generated for the axes, the axis labels, and the key.

This help file documents the microplot function. See [microplot-package](#) for information on the entire **microplot** package.

## Usage

```

microplot(object, ...)

## complete for an array of lattice panels
## S3 method for class 'trellis'
microplot(
  object=stop("trellis object is required", call. = FALSE),
  ## object must have class "trellis"
  figPrefix=first.word(deparse(substitute(object))),

```

```

vectorgraph.colname=figPrefix,
device=c("pdf","postscript","ps","png"),
res=600, type=getOption("bitmapType"), ## used by png
height.panel=1, width.panel=1, ## numeric in inches
collapse=layoutCollapse, ## Zero out unwanted
                                ## layout.heights and layout.widths.
                                ## See below for example.
height.x.axis=height.panel[1],
axis.line=list(col="black"),
xaxis.line=axis.line,
par.settings.x.axis=
  list(layout.heights=list(panel=0, axis.bottom=1,
                           axis.xlab.padding=0, xlab=0),
        axis.line=xaxis.line),
width.y.axis=width.panel[1],
yaxis.line=axis.line,
par.settings.y.axis=
  list(layout.widths=list(ylab=0, ylab.axis.padding=0,
                           axis.left=1, panel=0),
        axis.line=yaxis.line),
height.xlab=height.panel[1],
par.settings.xlab=
  list(layout.heights=list(panel=0, axis.bottom=0,
                           axis.xlab.padding=0, xlab=1),
        axis.line=list(col="transparent")),
width.ylab=width.panel[1],
par.settings.ylab=
  list(layout.widths=list(ylab=1, ylab.axis.padding=0,
                           axis.left=0, panel=0),
        axis.line=list(col="transparent")),
key=FALSE, ## FALSE or a list of arguments defining a key
height.key=height.panel[1], width.key=width.panel[1],
...) ## needed to match generic. ignored in the trellis method

```

```

## S3 method for class 'ggplot'
microplot(object, ## object has class "ggplot"
          collapse=theme_collapse(), ## theme_collapse(...) ?
          figPrefix=first.word(deparse(substitute(object))),
          vectorgraph.colname=figPrefix,
          height.panel=1, ## inch
          width.panel=1, ## inch
          height.x.axis=height.panel,
          width.y.axis=width.panel,
          height.xlab=height.panel,
          width.ylab=width.panel,
          height.key=height.panel,
          width.key=width.panel,

```

```

tick.text.size=7,
key=FALSE, ## FALSE, or a ggplot object which is a valid key
device=c("pdf","postscript","ps","png"),
res=600, type=getOption("bitmapType"), ## used by png
...)

## S3 method for class 'graphicsList'
microplot(object, ## an array of identically structured,
  ## single-panel, graphics objects (trellis or ggplot)
  ## with dim and dimnames
  figPrefix=first.word(deparse(substitute(object))),
  device=c("pdf","postscript","ps","png"),
  res=600, type=getOption("bitmapType"), ## used by png
  height.panel=1, width.panel=1, ## numeric in inches
  key=FALSE, ## FALSE, or a trellis or ggplot object which is a valid key
  height.key=height.panel, width.key=width.panel,
  ## valid arguments for microplot.trellis or microplot.ggplot
  ...)

```

## Arguments

object	"trellis", or "ggplot", or a graphicsList object of either all similarly constructed "trellis" objects of all similarly constructed ggplot objects.
collapse	Function that zeros out unwanted layout.heights and layout.widths space for "trellis" objects (see <a href="#">layoutCollapse</a> ), or that specifies a "theme" for ggplot objects (see <a href="#">theme_collapse</a> ).
figPrefix	Character string used as prefix for the generated files. The 'latex' macro \includegraphics requires that there be no "." in the filename basename. We replace all "." in the figPrefix by "-".
vectorgraph.colname	Character string used as column name when a vector of filenames is converted to a column matrix of filenames.
height.panel, width.panel	Height and width in inches of the generated graphics files.
height.x.axis, width.y.axis	Dimensions for axis graphics files—usually smaller than for panel contents.
height.xlab, width.ylab	Dimensions for graphics files containing axis labels—usually smaller than for panel contents.
par.settings.x.axis, par.settings.y.axis, par.settings.xlab, par.settings.ylab	"trellis" only: par.settings for axis and xlab files.
axis.line, xaxis.line, yaxis.line	"trellis" only: the usual lwd, col, cex and such that could be defined in the scales argument for xyplot.
key	Logical or list (for lattice) or ggplot object (for ggplot). If logical and FALSE there is no key (legend). If a list for microplot.trellis, it must be defined as described in <a href="#">xyplot</a> for "trellis" objects. If a "ggplot" object for

	microplot.ggplot it must be a valid ggplot object and will be displayed in the location appropriate for a legend.
height.key, width.key	Height and width in inches of key graphics file. Defaults to same height and width as the panels.
device	Function used to construct the graphics files. For latex with (options("latexcmd")=="pdflatex") use "pdf" (the default for pdflatex). For latex with (options("latexcmd")=="latex") use "postscript" (the default for latex). "ps" is equivalent to "postscript". For MSWord use "png". png defaults to res=600, type=getOption("bitmapType").
res, type	res is nominal resolution in ppi. type is either operating system-specific or "cairo". See <a href="#">png</a> and <a href="#">cairo</a> .
tick.text.size	Text size of the tick labels in the x and y axes (microplot.ggplot).
...	Arguments to panel function, i.e., cex and such for <b>lattice</b> . Similar arguments for <b>ggplot</b> . Currently ignored for the microplot.ggplot function.

### Value

Matrix of filenames with same dim and dimnames as the argument object. The result has class "microplotMatrix". There may be one or more attributes.

axis.names	contains filenames for the x and y axes.
lab.names	contains filenames for the xlab and ylab.
key.name	contains the filename for key (legend).

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

### See Also

[latex.trellis](#), [as.includegraphics](#), [latex](#), [msWord](#)

### Examples

## See demos

---

microplotAttrDisplay *Specify how to display the microplots for x.axis, y.axis, xlab, ylab, and key.*

---

### Description

Specify how to display the microplots for x.axis, y.axis, xlab, ylab, and key.

### Usage

```
microplotAttrDisplay(ii,
  y.axis=unname(attr(ii, "axis.names")["y"]),
  x.axis=unname(attr(ii, "axis.names")["x"]),
  ylab=unname(attr(ii, "lab.names")["y"]),
  xlab=unname(attr(ii, "lab.names")["x"]),
  key=attr(ii, "key.name"),
  columnKey=NULL,
  label.x.axis="", ## empty, nchar=0
  label.y.axis=" " ## one space, nchar=1
)
```

### Arguments

**ii** A "microplotMatrix" or "includegraphicsMatrix" of filenames of graphics files each containing one panel of an array of plots. There may be up to three attributes containing additional filenames.

**x.axis, y.axis** Vector of filenames containing graphic files of axes.

**label.x.axis, label.y.axis** Labels that will be used in the column name of the y.axis and the y.axis column for the x.axis row in the 'latex' display of the graphic.

**xlab, ylab** Vector of filenames containing graphic files of axis labels.

**key** Filename containing a graphics file containing a key (legend).

**columnKey** If the key is non-null, then place its filename as a new last value in the specified columns. The column numbering is with respect to the input ii before the y.axis or ylab are evaluated.

### Value

Revised version of the input ii, possibly augmented with additional rows for the x.axis, xlab, and key, and additional columns for the ylab and y.axis. The xlab is ignored unless the x.axis is also specified. The ylab is ignored unless the y.axis is also specified.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

**See Also**[microplot](#)**Examples**

```
## Not run:
latexSetOptions()

filenames <-
  structure(c("tt010.pdf", "tt007.pdf", "tt004.pdf", "tt001.pdf",
             "tt011.pdf", "tt008.pdf", "tt005.pdf", "tt002.pdf",
             "tt012.pdf", "tt009.pdf", "tt006.pdf", "tt003.pdf"),
           .Dim = c(4L, 3L),
           .Dimnames = structure(list(
             rr = c("d", "c", "b", "a"),
             cc = c("E", "F", "G")),
                                .Names = c("rr", "cc")),
           axis.names = structure(c("tt013.pdf", "tt014.pdf"), .Names = c("x", "y")),
           lab.names = structure(c("tt015.pdf", "tt016.pdf"), .Names = c("x", "y")),
           key.name = "tt017.pdf",
           class = c("microplotMatrix", "matrix"))

filenames

as.includegraphics(filenames, wd=".")

as.includegraphics(filenames, wd=".", as.attr=FALSE) ## default

as.includegraphics(filenames, wd=".", as.attr=TRUE)

as.includegraphics(filenames, wd=".", columnKey=1)

as.includegraphics(filenames, wd=".", columnKey=1:3)

as.includegraphics(filenames, wd=".", xlab=TRUE, ylab=TRUE)

as.includegraphics(filenames, wd=".",
                  label.x.axis="X tick values", label.y.axis="Y tick values")

tt <- data.frame(x=1:4, y=c(2,3,4,1), group=c("A","A","B","B"))
latex(lattice::xyplot(y ~ x | group, data=tt))
latex(lattice::xyplot(y ~ x | group, data=tt),
      label.x.axis="X Range", label.y.axis="Y Range")

demo("AEdotplot", package="microplot", ask=TRUE)

## End(Not run)
```

---

msWord	<i>Display a table in 'MS Word' containing panels from R graphs in its cells.</i>
--------	---

---

## Description

Display a table in 'MS Word' containing panels from R graphs in its cells. msWord methods for "trellis", "ggplot", "graphicsList", "microplotMatrix", and "includegraphicsMatrix" objects. The output file can be a .docx or .html file.

## Usage

```
msWord(object, ...)

## S3 method for class 'microplotMatrix'
msWord( ## calls msWord.graphicsClass
  object, ## microplotMatrix
  ## (matrix of filenames containing individual panels)
  ## (0 columns permitted)
  filetype=c("docx","html"),
  dataobject=matrix(, nrow(object), 0), ## numeric or character matrix
  data.first=TRUE,
  title=first.word(deparse(substitute(object))),
  rowlabel=title,
  rowname=rownames(object),
  data.header="data",
  graph.header="graph",
  graph.file.directory=".",
  axis.files=attr(object,"axis.names"),
  lab.files=attr(object,"lab.names"),
  key.file=attr(object,"key.name"),
  x.axis=(!is.null(axis.files) && !is.null(axis.files["x"])),
  y.axis=(!is.null(axis.files) && !is.null(axis.files["y"])),
  xlab=FALSE,
  ylab=FALSE,
  label.x.axis="", ## empty, nchar=0
  label.y.axis=" ", ## one space, nchar=1
  height.panel=1, ## inches
  width.panel=1, ## inches
  height.x.axis=height.panel[1], ## inches ## [1] is defensive for lazy evaluation
  width.y.axis=width.panel[1], ## inches
  height.xlab=height.panel[1], ## inches
  width.ylab=width.panel[1], ## inches
  height.key=height.panel[1], ## inches
  width.key=width.panel[1], ## inches
  FlexTableWidths=NULL, ## inches ## value used will be an attribute of result
  rmh.borders=TRUE,
```



```

caption=NULL,
file=paste0(title, ".", filetype),
doc.title="Microplot",
width.rowname=.4,
width.dataobject=1,
width.between=.1,
landscape=FALSE,
rgroup=NULL,
n.rgroup=NULL,
rgroup.exclude.borders=NULL,
key.align="center", ## flextable::align
...)

## S3 method for class 'graphicsClass'
msWord( ## calls msWord.graphicsClass
        object, ## called by trellis, ggplot, graphicsList methods
        ## microplot arguments
        figPrefix=first.word(deparse(substitute(object))),
        device="png",
        key=FALSE,
        title=figPrefix, ## subject to lazy evaluation
        ... ## can include arguments to
        ## microplot,
        ## msWord.microplotMatrix
        )

## S3 method for class 'trellis'
msWord( ## calls msWord.graphicsClass
        object=stop("trellis object is required", call. = FALSE),
        figPrefix=first.word(deparse(substitute(object))),
        title=figPrefix,
        ... ## can include arguments to
        ## msWord.graphicsClass,
        ## microplot,
        ## msWord.microplotMatrix
        )

## S3 method for class 'ggplot'
msWord(object=stop("ggplot object is required", call. = FALSE),
        figPrefix=first.word(deparse(substitute(object))),
        title=figPrefix,
        ... ## can include arguments to
        ## msWord.graphicsClass,
        ## microplot,
        ## msWord.microplotMatrix
        )

## S3 method for class 'graphicsList'

```

```

msWord(object=stop("graphicsList object is required", call. = FALSE),
  ## matrix or vector of trellis objects or ggplot objects,
  ## with dim and dimnames,
  ## normally each containing one panel.
  ## The axes and key will be taken from object[[1]].
  figPrefix=first.word(deparse(substitute(object))),
  title=figPrefix,
  ... ## can include arguments to
  ## msWord.graphicsClass,
  ## microplot,
  ## msWord.microplotMatrix
)

```

### Arguments

object	"microplotMatrix" (Matrix of filenames containing individual panels) (0 columns permitted).
filetype	File extension of generated file. Character, either "docx" or "html". For filetype="docx" the result is a variable containing the filename of a generated MS Word file. See the discussion of value below for additional information on the value. For filetype="html" the result is a variable containing a flextable object. See the discussion of value below to learn how to save the html file.
dataobject	Numeric or character matrix (or data.frame).
data.first	Logical. If TRUE, then output file will have dataobject columns first, then graphics object columns. If FALSE, then output file will have graphics object columns first, then dataobject columns.
title	Basename of generated file. We replace all "." in the title by "-".
figPrefix	See <a href="#">microplot.trellis</a> . The 'latex' macro \includegraphics requires that there be no "." in the filename basename. We also enforce this requirement for msWord. We replace all "." in the figPrefix by "-".
rowlabel	Header name for column of rownames in the generated file.
rowname	Rownames of constructed table. Default is rownames of object. Specify rowname=NULL to suppress the use of row names.
data.header, graph.header	Header names for groupings of data columns and graph columns. Used when both dataobject and object are present, one of them is not missing.
graph.file.directory	Directory containing files named in object.
axis.files, lab.files, key.file	Filenames for graphics files containing axes, axis labels, and key (legend).
x.axis, xlab	Logical. If x.axis==TRUE each column of graphs will have the x.axis file placed as the last item in that column. If both are TRUE then the xlab file will be placed in the row following the x.axis file.
y.axis, ylab	Logical. If y.axis==TRUE each row of graphs will have the y.axis file placed as the first item in that row. If both are TRUE, then the ylab file will be placed on each row immediately before the y.axis file.

label.x.axis, label.y.axis	Labels that will used in the column name of the y.axis and the y.axis position for the x.axis in the 'latex' display of the graphic.
height.panel, width.panel, height.x.axis, width.y.axis, height.xlab, width.ylab	See <a href="#">microplot</a> .
height.key, width.key, device, key	See <a href="#">microplot</a> .
FlexTableWidths	Widths of all columns, including header and between columns, in inches. The default is to base the widths on the widths of individual columns above. The actual widths used are returned as an attribute of the returned filename. You may wish to examine these values from the first run, and then modify them on second and later runs.
rmh.borders	My preferences for borders on cells based on the American Statistical Association ( <a href="https://academic.oup.com/DocumentLibrary/JSSMET/ASASTYLE_GUIDE.pdf">https://academic.oup.com/DocumentLibrary/JSSMET/ASASTYLE_GUIDE.pdf</a> ) style sheet. The <b>flextable</b> default, with full borders between rows, does not conform.
caption	The table will be rendered with a numbered caption containing this string as the caption value.
file	Name of generated file.
doc.title	Title that appears in the MS Word Properties list.
width.rowname	Number of inches for the rowname column.
width.dataobject	Number of inches for each column In the data.object.
width.between	Number of inches for the column between the object (graphs) and the dataobject (numbers or text).
landscape	Logical. If TRUE then the table is produced in a landscape orientation. If FALSE, then in a portrait orientation.
rgroup, n.rgroup, rgroup.exclude.borders	Argument names borrowed from <a href="#">latex</a> . rgroup gives the names of groupings of rows in the table. n.rgroup gives the number of rows within each group. rgroup.exclude.borders is not borrowed. It gives the row numbers of rows which are not to have a border between the rowname and the body of the table.
key.align	flextable::align one of left, right, center.
...	Additional arguments are currently ignored by msWord.microplotMatrix. They are forwarded to other methods by the other functions documented here.

## Value

The returned value depends on the filetype argument.

For filetype="docx", the value is the name of a generated file docx file with class "msWordFilename". Printing the returned value will display the generated file on screen. The result has an attribute "microplotMatrix" containing its argument object, which contains the names of the generated microplots. The result has an attribute showing the actual FlexTableWidths used. The user may wish to use the FlexTableWidths argument on a following run to modify these values.

For `filetype="html"`, the value is a `flextable` object. Printing the returned value will display the generated table in a browser window. If you wish to keep the html object, you **MUST** save it manually! The original file is in a temporary directory and will vanish when R is closed. Switch to the browser window and save the displayed table as a 'Web Archive' in a directory of your choice. Choose an appropriate basename for the saved file, as the default basename of the file is the noninformative "index".

### Note

The `msWord` function uses facilities provided by the **flextable** and **officer** packages.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

### Examples

```
## See demos.
```

---

<code>show.latexConsole</code>	<i>Revisions of Hmisc latex and dvi functions that display the generated latex file on screen and divert the console log to a file. New print methods that display Operating System files (ps, docx, html) on screen.</i>
--------------------------------	---

---

### Description

Revisions of Hmisc latex and dvi functions that display the generated latex file on screen and divert the console log to a file. New functions that display Operating System files ("`psFilename`", "`msWordFilename`", or "`htmlFilename`") on screen.

### Usage

```
## S3 method for class 'latexConsole'
dvi(object, prlog=FALSE, nomargins=TRUE, width=5.5, height=7, ...,
     ConsoleToFile=TRUE)

## S3 method for class 'latexConsole'
show(object)

## S3 method for class 'dviLC'
show(object, width = 5.5, height = 7,
     ConsoleToFile=TRUE)

## S3 method for class 'OSfilename'
print(x, wait=FALSE, ...)

## S3 method for class 'OSfilename'
```

```
show(x, wait=FALSE, ...)
```

### Arguments

object	For show.latexConsole and dvi.latexConsole, a c("latexConsole", "latex") object created by latex.trellis. For show.dvilC, a c("dvilC", "dvi") object created by dvi.latexConsole. x
ConsoleToFile	Logical. TRUE diverts 'latex' and 'dvips' console output to a file (and prints the file name). FALSE displays the console output on the 'R' console.
prlog, nomargins, width, height	See <a href="#">latex</a> .
x	The generic functions for print and show require x as the argument name.
wait	Logical, defaults to FALSE. Argument to <a href="#">system</a> command. FALSE indicates the print should run asynchronously, meaning the R interpreter is immediately ready for the next command. With TRUE the R interpreter would wait for the command to finish.
...	ignored

### Details

Extensions to 'Hmisc' functions dvi.latex, show.latex, show.dvi.

### Value

For dvi.latexConsole, a c('dvilC', 'dvi') object.

For show.latexConsole and show.dvilC, when viewer="dvips" a c("psFilename", "OSfilename") object, otherwise NULL.

For print.OSfilename, the input argument is returned invisibly. For show.OSfilename, NULL.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

### See Also

[latex](#), [microplot-package](#).

---

theme\_collapse      *Set the **ggplot2** theme to remove all marginal space.*

---

### Description

Set the ggplot2 theme to remove all marginal space. By default the grid, ticks, tick labels, and axis labels are set to blank. Margins are set to 0.

### Usage

```
theme_collapse(      ## the commented values are from theme_grey
  panel.grid.major=eb, ## element_line(colour = "white")
  panel.grid.minor=eb, ## element_line(colour = "white", size = 0.25)
  axis.ticks=eb,      ## element_line(colour = "grey20")
  axis.text=eb,       ## element_text(size = rel(0.8), colour = "grey30")
  axis.title=eb,      ## axis.title.x = element_text(
                      ##   margin = margin(t = 0.8 * half_line,
                      ##                   b = 0.8 * half_line/2))
                      ## axis.title.y = element_text(angle = 90,
                      ##   margin = margin(r = 0.8 * half_line,
                      ##                   l = 0.8 * half_line/2))
  plot.margin= grid::unit(c(0, 0, 0, 0), "in"),
  ...,
  eb=ggplot2::element_blank())
```

### Arguments

panel.grid.major, panel.grid.minor, axis.ticks, axis.text, axis.title, plot.margin  
**ggplot2** theme elements. See [theme](#) for information.

...      Other valid arguments to ggplot2::theme.

eb      Convenience for ggplot2::element\_blank().

### Details

When very small plots are placed inside a LaTeX tabular environment, it is often helpful to suppress margins, axes, labels, titles.

### Value

A ggplot2 theme object.

### Note

The first draft of theme\_collapse was written by Karen Byron.

### Author(s)

Richard M. Heiberger <rmh@temple.edu>

**Examples**

```
theme_collapse()
## Please see the package documentation for a simple example in context.

## Please see the demos for more interesting examples.
## demo(package="microplot")
```

---

toxicity	<i>Simulated toxicity data.</i>	<i>Dataset is used in</i>
	<i>demo("tablesPlusGraphicColumn").</i>	

---

**Description**

Simulated toxicity data. Used in `demo("tablesPlusGraphicsColumn", package="microplot")`. The demo shows a likert plot `likert` embedded in a table of numbers in both 'LaTeX' and 'MS Word'.

**Usage**

```
data("toxicity")
```

**Format**

A data frame with 4 observations on the following 5 variables.

Grade1 a numeric vector

Grade2 a numeric vector

Grade3 a numeric vector

Grade4 a numeric vector

Grade5 a numeric vector

**Author(s)**

Richard M. Heiberger <rmh@temple.edu>

**Examples**

```
## see demo("tablesPlusGraphicsColumn", package="microplot")
```

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