Package 'lemon'

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Type Package

Title Freshing Up your 'ggplot2' Plots

URL https://github.com/stefanedwards/lemon

BugReports https://github.com/stefanedwards/lemon/issues

Version 0.5.0

Description Functions for working with legends and axis lines of 'ggplot2', facets that repeat axis lines on all panels, and some 'knitr' extensions.

Depends R (>= 3.1.0)

Imports ggplot2 (>= 3.4.2), plyr, grid, gridExtra, gtable, knitr (>= 1.12), lattice, scales

License GPL-3

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Collate 'ggplot2.r' 'lemon-plot.r' 'axis-annotation.r' 'brackets.R' 'coord-flex.r' 'coord-capped.r' 'dot.r' 'facet-rep-lab.r' 'facet-wrap.r' 'geom-pointline.r' 'lemon_print.r' 'geom-siderange.r' 'grob_utils.r' 'gtable_show-.r' 'guides-axis.r' 'legends.r' 'lemon.r' 'scale-symmetric.r'

Suggests rmarkdown, stringr, dplyr, testthat, vdiffr, diffviewer

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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Contents

`.dot` *Create paths that are safe from changing working directory.*

Description

The `.dot` functions creates functions that allows relative-like specification of paths, but are safe from changing working directory.

Usage

```
.dot(x, root = getwd(), mustExist = FALSE, relative = FALSE, create = TRUE)

.dot2(names, quiet = FALSE, ...)
```

Arguments

`x`	File path that is appended to `BASEDIR`.
`root`	Root of your working directory, from which `x` is relative too.
`mustExist`	Logical value; if `TRUE` and the resulting path does not exist, it raises an error.
`relative`	For `.dot`, sets default for the returned function. For the returned function, when `TRUE`, the function returns a path relative to `root`.
`create`	Logical values, creates the target directory when `TRUE` (default).
`names`	Character vector of names

quiet	Logical value, suppresses output to stdout() when TRUE.
...	Arguments passed on to .dot.

Value

A function that returns file paths constructed from root, x, and ....

Side effect: It creates the directory.

Examples

```
.data <- .dot('data', create=FALSE)
.data('input.txt')
.data(c('a.txt','b.txt'))

.dot2(c('rawdata','results'), create=FALSE)
.rawdata('rawfile.csv')
.results('myresults.txt')
```

---

annotate_y_axis *Annotations on the axis*

Description

Annotations on the axis

Usage

```
annotate_y_axis(
  label,
  y,
  side = waiver(),
  print_label = TRUE,
  print_value = TRUE,
  print_both = TRUE,
  parsed = FALSE,
  ...
)

annotate_x_axis(
  label,
  x,
  side = waiver(),
  print_label = TRUE,
  print_value = TRUE,
  print_both = TRUE,
  parsed = FALSE,
  ...
)
```

Arguments

label	Text to print
y, x	Position of the annotation.
side	left or right, or top or bottom side to print annotation
print_label, print_value, print_both	Logical; what to show on annotation. Label and/or value. print_both is shortcut for setting both print_label and print_value. When both is TRUE, uses argument sep to separate the label and value.
parsed	Logical (default FALSE), when TRUE, uses mathplot for outputting expressions. See section "Showing values".
...	Style settings for label and tick: colour, hjust, vjust, size, fontface, family, rot. When waiver() (default), the relevant theme element is used.

Showing values

See plotmath for using mathematical expressions. The function uses a simple replacement strategy where the literal strings .(y) and .(val) are replaced by the value after round of to a number of digits, as given by argument digits.

Examples

```
library(ggplot2)

p <- ggplot(mtcars, aes(mpg, hp, colour=disp)) + geom_point()

l <- p + annotate_y_axis('mark at', y=200, tick=TRUE)
l

(l + annotate_x_axis('| good economy ->', x=25, print_value=FALSE, hjust=0, tick=TRUE))

l + annotate_y_axis("x^2 == .(y)", y=150, parsed=FALSE,  tick=FALSE) +
    annotate_y_axis("x^2 + bar(x) == .(y)", y=mean(mtcars$hp), parsed=TRUE, tick=TRUE)

l + annotate_y_axis("bar(x) == .(y)", y = mean(mtcars$hp),  parsed=TRUE, tick=FALSE)
# use double equal signs, or the output becomes '=(...)' for some reason.

l + annotate_y_axis('this is midway', y=sum(range(mtcars$hp))/2, print_value = FALSE, side='left')

# work around if an axis only contains parsed expressions
p + annotate_y_axis("bar(x) == .(y)", y = mean(mtcars$hp),  parsed=TRUE, tick=FALSE) +
  annotate_y_axis("some long string", y=100, tick=FALSE, print_value=FALSE, colour=NA)


# Works together with other functions
p <- p + theme_light() + theme(panel.border=element_blank(),
                               axis.line = element_line(),
                               axis.ticks = element_line(colour='black'))
p + coord_capped_cart(bottom='right') +
  annotate_y_axis('More than I\ncan afford', y=125,
                  print_value=FALSE, tick=TRUE)
```

brackets_horizontal *Axis brackets instead of axis ticks and lines*

Description

To be used with coord_flex_cart, coord_capped_cart, etc. for displaying brackets instead of the axis ticks and lines.

Usage

```
brackets_horizontal(
  direction = c("up", "down"),
  length = unit(0.05, "npc"),
  tick.length = waiver()
)

brackets_vertical(
  direction = c("left", "right"),
  length = unit(0.05, "npc"),
  tick.length = waiver()
)
```

Arguments

direction	Which way should the opening side of the brackets point? up, down, left, or right?
length	Length of the unit, parallel with axis line.
tick.length	Height (width) of x-axis (y-axis) bracket. If waiver() (default), use axis.ticks.length from theme.

Details

The looks of the brackets are taken from theme(axis.ticks), or theme(axis.ticks.x) and theme(axis.ticks.y), respectively.

It does not re-calculate tick marks, but lets scale_x_* and scale_y_* calculate and draw ticks and labels, and then modifies the ticks with brackets.

Both length and tick.length accepts a numeric scalar instead of a unit object that is interpreted as an "npc" unit.

See Also

unit

Examples

```
library(ggplot2)
p <- ggplot(mpg, aes(as.factor(cyl), hwy, colour=class)) +
  geom_point(position=position_jitter(width=0.3)) +
  theme_bw() +
  theme(panel.border = element_blank(), axis.line = element_line())
p

p <- p + coord_flex_cart(bottom=brackets_horizontal(length=unit(0.08, 'npc')))
p
# However getting the correct width is a matter of tweaking either length or
# position_jitter...

# A further adjustment,
p + theme(panel.grid.major.x = element_blank())
```

---

coord_capped_cart *Cartesian coordinates with capped axis lines.*

Description

Caps the axis lines to the outer ticks to e.g. indicate range of values. Methods correspond to coord_cartesian and coord_flip

Usage

```
coord_capped_cart(
  xlim = NULL,
  ylim = NULL,
  expand = TRUE,
  top = waiver(),
  left = waiver(),
  bottom = waiver(),
  right = waiver(),
  gap = 0.01
)

coord_capped_flip(
  xlim = NULL,
  ylim = NULL,
  expand = TRUE,
  top = waiver(),
  left = waiver(),
  bottom = waiver(),
  right = waiver(),
  gap = 0.01
)
```

```
capped_horizontal(capped = c("both", "left", "right", "none"), gap = 0.01)

capped_vertical(capped = c("top", "bottom", "both", "none"), gap = 0.01)
```

Arguments

xlim, ylim	Limits for the x and y axes.
expand	If TRUE, the default, adds a small expansion factor to the limits to ensure that data and axes don't overlap. If FALSE, limits are taken exactly from the data or xlim/ylim.
top, left, bottom, right	Either a function returned from capped_horizontal or brackets_horizontal. If string, it is assumed to be shorthand for capped_horizontal(capped) or similar for vertical.
gap	Both ends are *always* capped by this proportion. Usually a value between 0 and 1.
capped	Which end to cap the line. Can be one of (where relevant): both, none, left, right, top, bottom.

Details

This function is a simple override of coord_flex_cart and coord_flex_flip, which allows shorthand specification of what to cap.

NB! A panel-border is typically drawn on top such that it covers tick marks, grid lines, and axis lines. Many themes also do not draw axis lines. To ensure the modified axis lines are visible, use theme(panel.border=element_blank(), axis.lines=element_line()).

Examples

```
library(ggplot2)
# Notice how the axis lines of the following plot meet in the lower-left corner.
p <- ggplot(mtcars, aes(x = mpg)) + geom_dotplot() +
  theme_bw() +
  theme(panel.border=element_blank(), axis.line=element_line())
p

# We can introduce a gap by capping the ends:
p + coord_capped_cart(bottom='none', left='none')

# The lower limit on the y-axis is 0. We can cap the line to this value.
# Notice how the x-axis line extends through the plot when we no long
# define its capping.
p + coord_capped_cart(left='both')

# It it also works on the flipped.
p + coord_capped_flip(bottom='both')

# And on secondary axis, in conjuction with brackets:
p +
```

```
  scale_y_continuous(sec.axis = sec_axis(~.*100)) +
  scale_x_continuous(sec.axis = sec_axis(~1/., name='Madness scale')) +
  coord_capped_cart(bottom='none', left='none', right='both', top=brackets_horizontal())
# Although we cannot recommend the above madness.
```

`coord_flex_cart` *Cartesian coordinates with flexible options for drawing axes*

Description

Allows user to inject a function for drawing axes, such as `capped_horizontal` or `brackets_horizontal`.

Usage

```
coord_flex_cart(
  xlim = NULL,
  ylim = NULL,
  expand = TRUE,
  top = waiver(),
  left = waiver(),
  bottom = waiver(),
  right = waiver()
)

coord_flex_flip(
  xlim = NULL,
  ylim = NULL,
  expand = TRUE,
  top = waiver(),
  left = waiver(),
  bottom = waiver(),
  right = waiver()
)

coord_flex_fixed(
  ratio = 1,
  xlim = NULL,
  ylim = NULL,
  expand = TRUE,
  top = waiver(),
  left = waiver(),
  bottom = waiver(),
  right = waiver()
)
```

Arguments

xlim, ylim	Limits for the x and y axes.
expand	If TRUE, the default, adds a small expansion factor to the limits to ensure that data and axes don't overlap. If FALSE, limits are taken exactly from the data or xlim/ylim.
top, left, bottom, right	Function for drawing axis lines, ticks, and labels, use e.g. capped_horizontal or brackets_horizontal.
ratio	aspect ratio, expressed as y / x.

Details

NB! A panel-border is typically drawn on top such that it covers tick marks, grid lines, and axis lines. Many themes also do not draw axis lines. To ensure the modified axis lines are visible, use theme(panel.border=element_blank(), axis.line=element_line()).

User defined functions

The provided function in top, right, bottom, and left defaults to render_axis which is defined in 'ggplot2/R/coord-.r', which in turns calls guide_axis (see 'ggplot2/R/guides-axis.r').

The provided function is with the arguments scale_details, axis, scale, position, and theme, and the function should return an absoluteGrob object.

For examples of modifying the drawn object, see e.g. capped_horizontal or brackets_horizontal.

Examples

```
library(ggplot2)
# A standard plot
p <- ggplot(mtcars, aes(disp, wt)) +
 geom_point() +
 geom_smooth() + theme(panel.border=element_blank(), axis.line=element_line())

# We desire that left axis does not extend beyond '6'
# and the x-axis is unaffected
p + coord_capped_cart(left='top')

# Specifying 'bottom' caps the axis with at most the length of 'gap'
p + coord_capped_cart(left='top', bottom='none')

# We can specify a ridiculus large 'gap', but the lines will always
# protrude to the outer most ticks.
p + coord_capped_cart(left='top', bottom='none', gap=2)

# We can use 'capped_horizontal' and 'capped_vertical' to specify for
# each axis individually.
p + coord_capped_cart(left='top', bottom=capped_horizontal('none', gap=2))

# At this point we might as well drop using the short-hand and go full on:
p + coord_flex_cart(left=brackets_vertical(), bottom=capped_horizontal('left'))
```

```
# Also works with secondary axes:
p + scale_y_continuous(sec.axis=sec_axis(~5*., name='wt times 5')) +
  coord_flex_cart(left=brackets_vertical(), bottom=capped_horizontal('right'),
  right=capped_vertical('both', gap=0.02))


# Supports the usual 'coord_fixed':
p + coord_flex_fixed(ratio=1.2, bottom=capped_horizontal('right'))

# and coord_flip:
p + coord_flex_flip(ylim=c(2,5), bottom=capped_horizontal('right'))
```

`facet_rep_grid` *Repeat axis lines and labels across all facet panels*

Description

`facet_grid` and `facet_wrap`, but with axis lines and labels preserved on all panels.

Usage

```
facet_rep_grid(..., repeat.tick.labels = FALSE)

facet_rep_wrap(..., scales = "fixed", repeat.tick.labels = FALSE)
```

Arguments

`...`	Arguments used for `facet_grid` or `facet_wrap`.
`repeat.tick.labels`	When `FALSE` (default), axes on inner panels have their tick labels (i.e. the numbers) removed. Set this to `TRUE` to keep all labels, or any combination of top, bottom, left, right to keep only those specified. Also acceps 'x' and 'y'.
`scales`	As for `facet_grid`, but alters behaviour of `repeat.tick.labels`.

Details

These two functions are extensions to `facet_grid` and `facet_wrap` that keeps axis lines, ticks, and optionally tick labels across all panels.

Examples are given in the vignette "Repeat axis lines on facet panels" vignette.

geom_pointpath *Connected points*

Description

Geoms are soft-deprecated, and will not be supported in the future. Please use the ggh4x*-package*. geom_pointpath combines geom_point and geom_path, such that a) when jittering is used, both lines and points stay connected, and b) provides a visual effect by adding a small gap between the point and the end of line. geom_pointline combines geom_point and geom_path.

Usage

```
geom_pointpath(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE,
  distance = unit(3, "pt"),
  shorten = 0.5,
  threshold = 0.1,
  lineend = "butt",
  linejoin = "round",
  linemitre = 1,
  linesize = 0.5,
  linecolour = waiver(),
  linecolor = waiver(),
  arrow = NULL,
  ...
)

geom_pointline(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE,
  distance = unit(3, "pt"),
  shorten = 0.5,
  threshold = 0.1,
  lineend = "butt",
  linejoin = "round",
  linemitre = 1,
```

```
  linesize = 0.5,
  linecolour = waiver(),
  linecolor = waiver(),
  arrow = NULL,
  ...
)

geom_pointrangeline(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE,
  distance = unit(3, "pt"),
  lineend = "butt",
  linejoin = "round",
  linemitre = 1,
  linesize = 0.5,
  linecolour = waiver(),
  linecolor = waiver(),
  arrow = NULL,
  ...
)
```

Arguments

mapping	Set of aesthetic mappings created by aes or aes_.
data	The data to be displayed in this layer.
stat	The statistical transformation to use on the data for this layer, as a string.
position	Position adjustment, either as a string, or the result of a call to a position adjustment function (e.g. position_jitter). Both lines and points gets the same adjustment (*this* is where the function excels over geom_point() + geom_line()).
na.rm	If FALSE (default), missing values are removed with a warning. If TRUE, missing values are silently removed.
show.legend	Logical. Should this layer be included in the legends? NA (default), includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes.
inherit.aes	If FALSE, overrides the default aesthetic, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn't inherit behaviour from the default plot specification.
distance	Gap size between point and end of lines; use unit. Is converted to 'pt' if given as simple numeric. When NULL or NA, gapping and shorten/treshold is disabled. To keep the latter, set to 0.
shorten, threshold	When points are closer than threshold, shorten the line by the proportion in shorten instead of adding a gap by distance.

lineend	Line end style (round, butt, square).
linejoin	Line join style (round, mintre, bevel).
linemitre	Line mitre limit (number greater than 1).
linesize	Width of of line.
linecolour, linecolor	When not waiver(), the line is drawn with this colour instead of that set by aesthetic colour.
arrow	Arrow specification, as created by arrow.
...	other arguments passed on to layer.

Details

geom_pointpath connects the observations in the same order in which they appear in the data. geom_pointline connects them in order of the variable on the x-axis.

Both geom_pointpath and geom_pointline will only connect observations within the same group! However, if linecolour is *not* waiver(), connections will be made between groups, but possible in an incorrect order.

Aesthetics

geom_pointline and geom_pointpath understands the following aesthetics (required aesthetics are in bold):

- **x**
- **y**
- alpha
- colour – sets colour of point. Only affects line if linecolour=waiver().
- stroke
- shape
- stroke
- group
- linetype
- size – only affects point size. Width of line is set with linesize and cannot be linked to an aesthetic.

Examples

```
# geom_point examples
library(ggplot2)

p <- ggplot(mtcars, aes(wt, mpg))
p + geom_point() + geom_line()
p + geom_pointline()

p + geom_pointline(linecolour='brown')
```

```
p + geom_pointpath()

# Add aesthetic mappings
p + geom_pointline(aes(colour = factor(cyl)))
# Using linecolour preserved groups.
p + geom_pointline(aes(colour = factor(cyl)), linecolour='brown')

## If you want to combine the pretty lines of pointline that do *not* respect
## grouping (or order), combine several layers with geom_point on top:
p + geom_pointline() + geom_point(aes(colour=factor(cyl)))

# Change scales
p + geom_pointline(aes(colour = cyl)) + scale_colour_gradient(low = "blue")
p + geom_pointline(aes(colour = cyl), linecolour='black') + scale_colour_gradient(low = "blue")
p + geom_pointline(aes(shape = factor(cyl))) + scale_shape(solid = FALSE)

# For shapes that have a border (like 21), you can colour the inside and
# outside separately. Use the stroke aesthetic to modify the width of the
# border
ggplot(mtcars, aes(wt, mpg)) +
  geom_pointline(shape = 21, colour = "black", fill = "white",
                 size = 5, stroke = 5, distance = unit(10, 'pt'))

## Another example
df <- data.frame(x=rep(c('orange','apple','pear'), each=3),
                 b=rep(c('red','green','purple'), times=3), y=runif(9))
ggplot(df, aes(x=x, y=y, colour=b, group=b)) +
  geom_pointline(linesize=1, size=2, distance=6) + theme_bw()

# geom_pointline() is suitable for time series
ggplot(economics, aes(date, unemploy)) + geom_pointline()
ggplot(economics_long, aes(date, value01, colour = variable)) +
  geom_pointline()
```

`geom_siderange` *Display range of data in side of plot*

Description

Projects data onto horizontal or vertical edge of panels.

Usage

```
geom_siderange(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  ...,
  distance = 3,
```

```
  arrow = NULL,
  lineend = "butt",
  sides = "bl",
  start = NA,
  end = NA,
  na.rm = FALSE,
  show.legend = NA,
  inherit.aes = TRUE
)
```

Arguments

mapping	Set of aesthetic mappings created by aes or aes_.
data	The data to be displayed in this layer.
stat	The statistical transformation to use on the data for this layer, as a string.
position	Position adjustment, either as a string, or the result of a call to a position adjustment function (e.g. position_jitter). Both lines and points gets the same adjustment (*this* is where the function excels over geom_point() + geom_line()).
...	other arguments passed on to layer.
distance	Distance between edge of panel and lines, and distance between lines, in multiples of line widths, see description.
arrow	Arrow specification, as created by arrow.
lineend	Line end style (round, butt, square).
sides	Character including **t**op, **r**ight, **b**ottom, and/or **l**eft, indicating which side to project data onto.
start, end	Adds a symbol to either end of the siderange. start corresponds to minimal value, end to maximal value.
na.rm	If FALSE (default), missing values are removed with a warning. If TRUE, missing values are silently removed.
show.legend	Logical. Should this layer be included in the legends? NA (default), includes if any aesthetics are mapped. FALSE never includes, and TRUE always includes.
inherit.aes	If FALSE, overrides the default aesthetic, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn't inherit behaviour from the default plot specification.

Details

The geom_siderange projects the data displayed in the panel onto the sides, using the same aesthetics. It has the added capability of potting a symbol at either end of the line, and lines are offset from the edge and each other.

To display a symbol, specify an integer for either start or end. See the list for pch in points for values to use. The argumetns start and end also accepts a list object with named entries pch, alpha, stroke, and fill, which correspond to the usual aesthetics, as well as a special named entry, sizer (note the extra 'r'). This last entry is a multiplier for enlarging the symbol relative to the linewidth, as the aesthetic size affects both linewidth and symbol size.

The distance between the panel's edge and sideranges are specified by the argument `distance`. If a symbol is specified, the linewidth is further expanded to cover the width of the symbol (including `sizer`).

Aesthetics

The geom understands the following aesthetics (required are in bold):

- **x**
- **y**
- alpha
- colour
- fill (if a symbol is applied with `start` or `end`
- group
- linetype
- size
- stroke

See Also

`geom_rug`

Examples

```
library(ggplot2)

x <- rnorm(25)
df <- data.frame(x=x, y=x+rnorm(25, sd=0.2),
                 a=sample(c('horse','goat'), 25, replace=TRUE),
                 stringsAsFactors = FALSE)
df$y <- with(df, ifelse(y > 1 & a=='horse', 1, y))
(p <- ggplot(df, aes(x=x, y=y, colour=a)) + geom_point(shape=1))

p + geom_siderange(start=19)

# Capping the sideranges with different symbols:
p + geom_siderange(start=19, end=22, fill='black', sides='b') + geom_siderange(sides='tl')

# It also works with facets

p <- ggplot(mpg, aes(displ, hwy, colour=fl)) +
  geom_point() +
  facet_wrap(~class, nrow = 4)

p + geom_siderange()
```

get_panel_range *Version safe(r) method to get the y- and x-range from trained scales.*

Description

The names of the internal layout objects from ggplot_build changed slightly.

Usage

```
get_panel_y_range(layout, index = 1)

get_panel_x_range(layout, index = 1)

get_panel_params(layout, index = 1)
```

Arguments

layout	layout part from ggplot_build
index	Could be panel number?

grid_arrange_shared_legend *Share a legend between multiple plots*

Description

Extract legend, combines plots using arrangeGrob / grid.arrange, and places legend in a margin.

Usage

```
grid_arrange_shared_legend(
  ...,
  ncol = length(list(...)),
  nrow = 1,
  position = c("bottom", "right", "top", "left"),
  plot = TRUE
)
```

Arguments

...	Objects to plot. First argument should be a ggplot2 object, as the legend is extracted from this. Other arguments are passed on to arrangeGrob, including named arguments that are not defined for grid_arrange_shared_legend. ggplot2 objects have their legends hidden.
ncol	Integer, number of columns to arrange plots in.

nrow	Integer, number of rows to arrange plots in.
position	'bottom' or 'right' for positioning legend.
plot	Logical, when TRUE (default), draws combined plot on a new page.

Value

gtable of combined plot, invisibly. Draw gtable object using grid.draw.

Author(s)

Originally brought to you by Baptiste Auguié (https://github.com/tidyverse/ggplot2/wiki/Share-a-legend-between-two-ggplot2-graphs) and Shaun Jackman (original). Stefan McKinnon Edwards added left and top margins.

See Also

g_legend, reposition_legend

Examples

```
library(ggplot2)
dsamp <- diamonds[sample(nrow(diamonds), 300), ]
p1 <- qplot(carat, price, data = dsamp, colour = clarity)
p2 <- qplot(cut, price, data = dsamp, colour = clarity)
p3 <- qplot(color, price, data = dsamp, colour = clarity)
p4 <- qplot(depth, price, data = dsamp, colour = clarity)
grid_arrange_shared_legend(p1, p2, p3, p4, ncol = 4, nrow = 1)
grid_arrange_shared_legend(p1, p2, p3, p4, ncol = 2, nrow = 2)

# Passing on plots in a grob are not touched
grid_arrange_shared_legend(p1, gridExtra::arrangeGrob(p2, p3, p4, ncol=3), ncol=1, nrow=2)

# We can also pass on named arguments to arrangeGrob:
title <- grid::textGrob('This is grob', gp=grid::gpar(fontsize=14, fontface='bold'))
nt <- theme(legend.position='none')
grid_arrange_shared_legend(p1,
   gridExtra::arrangeGrob(p2+nt, p3+nt, p4+nt, ncol=3), ncol=1, nrow=2,
   top=title)
```

---

gtable_show_grill *Visualise underlying gtable layout.*

Description

Visualises the table structure or the names of the gtable's components.

Usage

```
gtable_show_grill(x, plot = TRUE)

gtable_show_names(
  x,
  plot = TRUE,
  rect.gp = grid::gpar(col = "black", fill = "white", alpha = 1/4)
)
```

Arguments

x	A gtable object. If given a ggplot object, it is converted to a gtable object with ggplotGrob.
plot	Logical. When TRUE (default), draws resulting gtable object on a new page.
rect.gp	Graphical parameters (gpar) for background drop.

Details

These functions are highly similar to gtable_show_layout. gtable_show_grill draws the grid of the underlying table, and places row and column indicies in the margin. gtable_show_names replaces the grobs with a semi-transparent rectangle and the component's name.

Value

Modified gtable object, invisibly.

Examples

```
library(ggplot2)
library(gtable)
library(grid)

p <- ggplot(mtcars, aes(wt, mpg)) + geom_point()

gtable_show_grill(p)
library(ggplot2)
library(gtable)
library(grid)

p <- ggplot(mtcars, aes(wt, mpg)) + geom_point()

gtable_show_names(p)
```

guidebox_as_column *Guidebox as a column*

Description

Takes a plot or legend and returns a single guide-box in a single column, for embedding in e.g. tables.

Usage

```
guidebox_as_column(legend, which.legend = 1, add.title = FALSE)
```

Arguments

legend	A ggplot2 plot or the legend extracted with g_legend. *Do not* provide a ggplotGrob as it is indistinguisble from a legend.
which.legend	Integer, a legend can contain multiple guide-boxes (or vice versa?). Use this argument to select which to use.
add.title	Does nothing yet.

Value

A gtable with keys and labels reordered into a single column and each pair of keys and labels in the same cell.

See Also

g_legend

Examples

```
library(ggplot2)

p <- ggplot(diamonds, aes(x=x, y=y, colour=cut)) + geom_point()
guidebox_as_column(p)
p <- p + guides(colour=guide_legend(ncol=2, byrow=TRUE))
guidebox_as_column(p)
```

g_legend *Extract ggplot legends*

Description

Extracts the legend ('guide-box') from a ggplot2 object.

Usage

```
g_legend(a.gplot)
```

Arguments

a.gplot	ggplot2 or gtable object.

Details

The extraction is applied *after* the plot is trained and themes are applied. Modifying the legend is easiest by applying themes etc. to the ggplot2 object, before calling g_legend.

An alternative method for extracting the legend is using gtable::gtable_filter:

```
gtable_filter(ggplotGrob(a.ggplot.obj), 'guide-box')
```

This method however returns a gtable object which encapsulates the entire legend. The legend itself may be a collection of gtable. We have only noticed a problem with this extra layer when using the returned legend with arrangeGrob (see examples).

Value

gtable (grob) object. Draw with grid.draw.

Author(s)

Baptiste Auguié

See Also

grid_arrange_shared_legend, reposition_legend, gtable_filter

Examples

```
library(ggplot2)
library(gtable)
library(grid)
library(gridExtra)
library(gtable)
dsamp <- diamonds[sample(nrow(diamonds), 1000), ]
(d <- ggplot(dsamp, aes(carat, price)) +
```

```
 geom_point(aes(colour = clarity)) +
 theme(legend.position='bottom'))

legend <- g_legend(d)
grid.newpage()
grid.draw(legend)

(d2 <- ggplot(dsamp, aes(x=carat, fill=clarity)) +
  geom_histogram(binwidth=0.1) +
 theme(legend.position='bottom'))

grid.arrange(d  + theme(legend.position='hidden'),
             d2 + theme(legend.position='hidden'),
             bottom=legend$grobs[[1]])
# Above fails with more than one guide

legend2 <- gtable_filter(ggplotGrob(d), 'guide-box')
grid.arrange(d  + theme(legend.position='hidden'),
             d2 + theme(legend.position='hidden'),
             bottom=legend2$grobs[[1]]$grobs[[1]])
# Above fails with more than one guide
```

`is.small` *Is a given unit 'small'?*

Description

Uses a holistic approach to determine whether a unit is 'small', i.e. less than 1 cm, 1 line, 10 pt, or 0.4 in.

Usage

```
is.small(x)
```

Arguments

`x`	A unit.

Details

Based on arbitraily chosen definitions of 'small', this function can return `TRUE` or `FALSE` if a unit is 'small'.

So far, less than 1 cm, 1 line, 10 pt, or 0.4 inches is defined as being 'small'. Unresolved sizes, suchs as 'grobheight', 'grobwidth', or 'null' are not small. Units based on arithmetic, such as sum of multiple units, are also *not* small. `NA`s are returned for undecided sizes.

Value

Logical or NA.

---

lemon *Freshing up your ggplots*

Description

Collection of misc. functions for changing subtle aspects of ggplots. Works mostly on gtables produced prior to printing.

Functions for axis

See coord_capped_cart and coord_flex_cart. The latter is a shorthand version of the former. It automatically uses capped_horizontal and capped_vertical, but both accepts these as well as brackets_horizontal and brackets_vertical.

Legends

Extract legend g_legend

Many plots, one legend grid_arrange_shared_legend

Place legend exactly on plot reposition_legend

Facets

facet_rep_grid and facet_rep_wrap are extensions to the wellknown facet_grid and facet_wrap where axis lines and labels are drawn on all panels.

Extending knitr

We automatically load knitr's knit_print for data frames and dplyr tables to provide automatic pretty printing of data frame using kable.

See lemon_print or vignette('lemon_print', 'lemon').

Relative paths safe from hanging directory: .dot.

Author(s)

Stefan McKinnon Edwards <sme@iysik.com>

Contributions from Baptiste Auguié on g_legend and grid_arrange_shared_legend.

Contributions from Shaun Jackman on grid_arrange_shared_legend.

Source

https://github.com/stefanedwards/lemon

See Also

Useful links:

- https://github.com/stefanedwards/lemon
- Report bugs at https://github.com/stefanedwards/lemon/issues

---

`lemon_print` *knitr extension: Always use 'kable' for data frames.*

Description

Convenience function for working with R Notebooks that ensures data frames (and dplyr tables) are printed with `kable` while allowing RStudio to render the data frame dynamically for inline display.

Usage

```
lemon_print(x, options, ...)

## S3 method for class 'data.frame'
lemon_print(x, options, ...)

## S3 method for class 'table'
lemon_print(x, options, ...)
```

Arguments

`x`	an data frame or dplyr table object to be printed
`options`	Current chunk options are passed through this argument.
`...`	Ignored for now.

Details

These functions divert data frame and summary output to `kable` for nicely printing the output.

For *options to* `kable`, they can be given directly as chunk-options (see arguments to `kable`), or though as a list to a special chunk-option `kable.opts`.

For more examples, see `vignette('lemon_print', package='lemon')`.

Knitr usage

To use for a single chunk, do

````
```{r render=lemon_print,caption='My data frame'}
data.frame
```
````

Note: We are *not* calling the function, but instead refering to it.

An alternate route for specifying kable arguments is as:

```
```{r render=lemon_print,kable.opts=list(align='l')}
data.frame
```
```

The option `kable.opts` takes precendence over arguments given directly as chunk-options.

To enable as default printing method for *all chunks*, include

```
knit_print.data.frame <- lemon_print
knit_print.table <- lemon_print
knit_print.grouped_df <- lemon_print # enableds dplyr results
knit_print.tibble <- lemon_print
knit_print.tbl <- lemon_print
```

Note: We are *not* calling the function, but instead assigning the knit_print functions for some classes.

To disable, temporarily, specify chunk option:

```
```{r render=normal_print}`
data.frame
```
```

See Also

knit_print, kable

`remove_labels_from_axis` *Removes labels from axis grobs.*

Description

Called from FacetGridRepeatLabels.

Usage

```
remove_labels_from_axis(axisgrob, direction = c("horizontal", "vertical"))
```

Arguments

`axisgrob`	Grob with an axis.
`direction`	Whether the axis is horizontal or vertical.

`reposition_legend` *Reposition a legend onto a panel*

Description

Repositions a legend onto a panel, by either taking it from the same ggplot, or by using another. Works on both ggplot2 and gtable objects, and can accept any grob as legend.

Usage

```
reposition_legend(
  aplot,
  position = NULL,
  legend = NULL,
  panel = "panel",
  x = NULL,
  y = NULL,
  just = NULL,
  name = "guide-box",
  clip = "on",
  offset = c(0, 0),
  z = Inf,
  plot = TRUE
)
```

Arguments

`aplot`	a ggplot2 or gtable object.
`position`	Where to place the legend in the panel. Overrules `just` argument.
`legend`	The legend to place, if `NULL` (default), it is extracted from `aplot` if this is a ggplot2 object.
`panel`	Name of panel in gtable. See description.
`x`	horisontal coordinate of legend, with 0 at left.
`y`	vertical coordiante of legend, with 0 at bottom.
`just`	'Anchor point' of legend; it is this point of the legend that is placed at the `x` and `y` coordinates.
`name`, `clip`, `z`	Parameters forwarded to `gtable_add_grob`.
`offset`	Numeric vector, sets distance from edge of panel. First element for horisontal distance, second for vertical. Not used by arguments `x` and `y`.
`plot`	Logical, when `TRUE` (default), draws plot with legend repositioned on a new page.

Details

To modify the look of the legend, use themes and the natural ggplot functions found in guide_legend.

Positioning is done by argument position which places the panel relative in panel (see below). position resolves to three variables, x, y, and just. x and y is the coordinate in panel, where the anchorpoint of the legend (set via just) is placed. In other words, just='bottom right' places the bottom right corner of the legend at coordinates (x,y).

The positioning can be set by argument position alone, which can be further nudged by setting position, x, and y. Alternatively, manually positioning can be obtained by setting arguments. x, y, and just.

Panel name is by default panel, but when using facets it typically takes the form panel-{col}-{row}, but not for wrapped facets. Either print result from ggplotGrob or use gtable_show_names to display all the names of the gtable object.

panel takes multiple names, and will then use these components' extremes for placing the legend.

If panel is an integer vector of length 2 or 4, these elements are used directly for top-left and bottom-right coordinates.

Value

gtable object, invisibly, with legend repositioned. Can be drawn with grid.draw.

Author(s)

Stefan McKinnon Edwards <sme@iysik.com>

See Also

g_legend, grid_arrange_shared_legend and gtable_show_names for displaying names of facet's panels.

Examples

```
library(ggplot2)
dsamp <- diamonds[sample(nrow(diamonds), 1000), ]
(d <- ggplot(dsamp, aes(carat, price)) +
 geom_point(aes(colour = clarity)))

reposition_legend(d + theme(legend.position='bottom'), 'bottom right')

# To change the orientation of the legend, use theme's descriptors.
reposition_legend(d + theme(legend.position='bottom'), 'top left')

# Use odd specifications, here offset the legend with half its height from the bottom.
reposition_legend(d + theme(legend.position='bottom'), x=0.3, y=0, just=c(0, -0.5))

# For using with facets:
reposition_legend(d + facet_grid(.~cut), 'top left', panel = 'panel-1-5')
```

scale_x_symmetric *Symmetrix position scale for continuous x and y*

Description

scale_x_symmetric and scale_y_symmetric are like the default scales for continuous x and y, but ensures that the resulting scale is centered around mid. Does not work when setting limits on the scale.

Usage

```
scale_x_symmetric(mid = 0, ...)

scale_y_symmetric(mid = 0, ...)
```

Arguments

mid	Value to center the scale around.
...	Values passed on to scale_continuous.

Examples

```
library(ggplot2)
df <- expand.grid(a=c(-1,0,1), b=c(-1,0,1))
rnorm2 <- function(x,y,n,sdx,sdy) {
  if (missing(sdy))
    sdy <- sdx
  data.frame(a=x,b=y,x=rnorm(n,x,sdx), y=rnorm(n,y,sdy))
}
df <- mapply(rnorm2,df$a, df$b, MoreArgs=list(n=30,sdx=1),SIMPLIFY=FALSE)
df <- do.call(rbind, df)
(p <- ggplot(df, aes(x=x,y=y)) + geom_point() +
  facet_grid(a~b, scales='free_x')
)
p + scale_x_symmetric(mid=0)
```

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