

Package ‘mapsf’

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Title Thematic Cartography

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Description Create and integrate thematic maps in your workflow. This package helps to design various cartographic representations such as proportional symbols, choropleth or typology maps. It also offers several functions to display layout elements that improve the graphic presentation of maps (e.g. scale bar, north arrow, title, labels). 'mapsf' maps 'sf' objects on 'base' graphics.

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URL <https://github.com/riatelab/mapsf/>,
<https://riatelab.github.io/mapsf/>

BugReports <https://github.com/riatelab/mapsf/issues/>

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mapsf

Package description

Description

Create maps with simple features. mapsf helps to map sf objects and offers features that improve the graphic presentation of maps (scale bar, north arrow, title or legend).

mf_annotation	<i>Plot an annotation</i>
---------------	---------------------------

Description

Plot an annotation on a map.

Usage

```
mf_annotation(  
  x,  
  txt,  
  pos = "topright",  
  cex = 0.8,  
  col_arrow,  
  col_txt,  
  halo = FALSE,  
  bg,  
  s = 1,  
  ...  
)
```

Arguments

x	an sf object with 1 row, a couple of coordinates (c(x, y)).
txt	the text to display
pos	position of the text, one of "topleft", "topright", "bottomright", "bottomleft" or "interactive"
cex	size of the text
col_arrow	arrow color
col_txt	text color
halo	add a halo around the text
bg	halo color
s	arrow size (min=1)
...	further text arguments.

Value

No return value, an annotation is displayed.

Examples

```

mtq <- mf_get_mtg()
mf_map(mtg)
mf_annotation(
  x = c(711167.8, 1614764),
  txt = "Look!\nImportant feature\nhere!",
  pos = "bottomleft", cex = 1.2, font = 2,
  halo = TRUE, s = 1.5
)

mf_annotation(
  x = mtq[20, ],
  txt = "This is less\nimportant",
  cex = .7, font = 3, s = 1.3
)

```

mf_arrow

Plot a north arrow

Description

Plot a north arrow.

Usage

```
mf_arrow(pos = "topleft", col, adjust)
```

Arguments

pos	position. It can be one of 'topleft', 'top', 'topright', 'right', 'bottomright', 'bottom', 'bottomleft', 'left', 'interactive' or a vector of two coordinates in map units (c(x, y))
col	arrow color
adjust	object of class sf or sfc used to adjust the arrow to the real north

Value

No return value, a north arrow is displayed.

Examples

```

mtq <- mf_get_mtg()
mf_map(mtg)
mf_arrow(pos = "topright")

```

mf_background	<i>Plot a background image</i>
---------------	--------------------------------

Description

Plot a background image on an existing plot

Usage

```
mf_background(filename, ...)
```

Arguments

filename	filename of the background image, PNG or JPG/JPEG format.
...	further parameters for rasterImage

Value

No return value, a background image is displayed.

Examples

```
mtq <- mf_get_mtg()
mf_init(mtg)
mf_background(system.file("img/background.jpg", package = "mapsf"))
mf_map(mtg, lwd = 3, col = NA, border = "white", add = TRUE)
mf_credits(
  txt = "Background photo by Noita Digital on Unsplash",
  col = "white"
)
```

mf_credits	<i>Plot credits</i>
------------	---------------------

Description

Plot credits (sources, author, year...).

Usage

```
mf_credits(
  txt = "Source(s) & Author(s)",
  pos = "bottomleft",
  col,
  cex = 0.6,
  font = 3,
  bg = NA
)
```

Arguments

txt	text of the credits, use '\n' to add line breaks
pos	position, one of 'bottomleft', 'bottomright' or 'rightbottom'
col	color
cex	cex of the credits
font	font of the credits
bg	background color

Value

No return value, credits are displayed.

Examples

```
mtq <- mf_get_mtq()
mf_map(mtq)
mf_credits(txt = "Author\nSources - Year")
```

mf_export

Export a map

Description

Export a map with the extent of a spatial object. The map is exported in PNG or SVG format. If only one of width or height is set, mf_export uses the width/height ratio of x bounding box to find a matching ratio for the export.

Usage

```
mf_export(
  x,
  filename = "map.png",
  width,
  height,
  res = 96,
  ...,
  expandBB = rep(0, 4),
  theme,
  export = "png"
)
```

Arguments

x	object of class sf, sfc or Raster
filename	path to the exported file. If the file extension is ".png" a png graphic device is opened, if the file extension is ".svg" a svg graphic device is opened.
width	width of the figure (pixels for png, inches for svg)
height	height of the figure (pixels for png, inches for svg)
res	resolution (for png)
...	further parameters for png or svg export
expandBB	fractional values to expand the bounding box with, in each direction (bottom, left, top, right)
theme	apply a theme
export	deprecated

Value

No return value, a map is initiated.

Examples

```
mtq <- mf_get_mtg()
(filename <- tempfile(fileext = ".png"))
mf_export(mtq, filename = filename)
mf_map(mtq, add = TRUE)
dev.off()
```

mf_get_breaks

Get class intervals

Description

A function to classify continuous variables.

Usage

```
mf_get_breaks(x, nbreaks, breaks, k = 1, central = FALSE, ...)
```

Arguments

x	a vector of numeric values
nbreaks	a number of classes
breaks	a classification method; one of "fixed", "sd", "equal", "pretty", "quantile", "kmeans", "hclust", "bclust", "fisher", "jenks", "dpih", "q6", "geom", "arith", "em" or "msd" (see Details).
k	number of standard deviation for "msd" method (see Details)
central	creation of a central class for "msd" method (see Details)
...	further arguments of classIntervals

Details

"fixed", "sd", "equal", "pretty", "quantile", "kmeans", "hclust", "bclust", "fisher", "jenks" and "dpih" are [classIntervals](#) methods. You may need to pass additional arguments for some of them.

Jenks ("jenks" method) and Fisher ("fisher" method) algorithms are based on the same principle and give quite similar results but Fisher is much faster.

The "q6" method uses the following [quantile](#) probabilities: 0, 0.05, 0.275, 0.5, 0.725, 0.95, 1.

The "geom" method is based on a geometric progression along the variable values.

The "arith" method is based on an arithmetic progression along the variable values.

The "em" method is based on nested averages computation.

The "msd" method is based on the mean and the standard deviation of a numeric vector. The nbreaks parameter is not relevant, use k and central instead. k indicates the extent of each class in share of standard deviation. If central=TRUE then the mean value is the center of a class else the mean is a break value.

Value

A numeric vector of breaks

Note

This function is mainly a wrapper of [classIntervals](#) + "arith", "em", "q6", "geom" and "msd" methods.

See Also

[classIntervals](#)

Examples

```
mtq <- mf_get_mtq()
mf_get_breaks(x = mtq$MED, nbreaks = 6, breaks = "quantile")
```

mf_get_links

Get a link layer from a data.frame of links.

Description

Create a link layer from a data.frame of links and an sf object.

Usage

```
mf_get_links(x, df, x_id, df_id)
```


Arguments

x	an sf object, a simple feature collection.
df	a data.frame that contains identifiers of starting and ending points.
x_id	name of the identifier variable in x, default to the first column (optional)
df_id	names of the identifier variables in df, character vector of length 2, default to the two first columns. (optional)

Value

An sf object is returned, it is composed of df and the sfc (LINESTRING) of links.

Examples

```
mtq <- mf_get_mtg()
mob <- read.csv(system.file("csv/mob.csv", package = "mapsf"))
# Select links from Fort-de-France (97209)
mob_97209 <- mob[mob$i == 97209, ]
# Create a link layer
mob_links <- mf_get_links(x = mtq, df = mob_97209)
# Plot the links
mf_map(mtq)
mf_map(mob_links, col = "red4", lwd = 2, add = TRUE)
```

mf_get_mtg

Get the 'mtq' dataset

Description

Import the mtq dataset (Martinique municipalities).

Usage

```
mf_get_mtg()
```

Details

This a wrapper around `st_read(system.file("gpkg/mtq.gpkg", package = "mapsf"), quiet = TRUE)`.

Value

an sf object of Martinique municipalities

Examples

```
mtq <- mf_get_mtg()
```

mf_get_pal

*Get color palettes***Description**

mf_get_pal builds sequential, diverging and qualitative color palettes. Diverging color palettes can be dissymmetric (different number of colors in each of the two gradients).

Usage

```
mf_get_pal(n, palette, alpha = NULL, rev = c(FALSE, FALSE), neutral)
```

Arguments

n	the number of colors (≥ 1) to be in the palette.
palette	a valid palette name (one of <code>hcl.pals()</code>). The name is matched to the list of available palettes, ignoring upper vs. lower case, spaces, dashes, etc. in the matching.
alpha	an alpha-transparency level in the range [0,1] (0 means transparent and 1 means opaque), see argument alpha in <code>hsv</code> and <code>hcl</code> , respectively.
rev	logical indicating whether the ordering of the colors should be reversed.
neutral	a color, if two gradients are used, the 'neutral' color can be added between them.

Details

See [hcl.pals](#) to get available palette names. If two gradients are used, the 'neutral' color can be added between them.

Value

A vector of colors.

Examples

```
cols <- mf_get_pal(n = 10, pal = "Reds 2")
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
cols <- mf_get_pal(n = c(3, 7), pal = c("Reds 2", "Greens"))
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
cols <- mf_get_pal(n = c(5, 5), pal = c("Reds 2", "Greens"))
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
cols <- mf_get_pal(n = c(7, 3), pal = c("Reds 2", "Greens"))
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
cols <- mf_get_pal(n = c(5, 5), pal = c("Reds 2", "Greens"), neutral = "grey")
plot(1:11, rep(1, 11), bg = cols, pch = 22, cex = 4)
opar <- par(bg = "black")
cols <- mf_get_pal(n = c(7, 3), pal = c("Reds 2", "Greens"), alpha = c(.3, .7))
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
```

```
par(opar)
cols <- mf_get_pal(
  n = c(5, 5), pal = c("Reds 2", "Greens"),
  rev = c(TRUE, TRUE)
)
plot(1:10, rep(1, 10), bg = cols, pch = 22, cex = 4)
```

mf_init*Initialize a map with a specific extent*

Description

Plot an invisible layer with the extent of a spatial object.

Usage

```
mf_init(x, expandBB = rep(0, 4), theme)
```

Arguments

x	object of class sf, sfc or Raster
expandBB	fractional values to expand the bounding box with, in each direction (bottom, left, top, right)
theme	apply a theme from mf_theme

Value

No return value, a map is initiated.

Examples

```
mtq <- mf_get_mtg()
target <- mtq[30, ]
mf_init(target)
mf_map(mtq, add = TRUE)
```

mf_inset_on

*Plot an inset***Description**

This function is used to add an inset map to the current map.

Usage

```
mf_inset_on(x, pos = "topright", cex = 0.2, fig)
```

```
mf_inset_off()
```

Arguments

x	an sf object, or "worldmap" to use with mf_worldmap .
pos	position, one of "bottomleft", "left", "topleft", "top", "bottom", "bottomright", "right", "topright"
cex	share of the map width occupied by the inset
fig	coordinates of the inset region (in NDC, see in ?par())

Details

If x is used (with pos and cex), the width/height ratio of the inset will match the width/height ratio of x bounding box.

If fig is used, coordinates (xmin, xmax, ymin, ymax) are expressed as fractions of the mapping space (i.e. excluding margins).

If map layers have to be plotted after the inset (i.e after mf_inset_off()), please use add = TRUE.

It is not possible to plot an inset within an inset.

It is possible to plot anything (base plots) within the inset, not only map layers.

Value

No return value, an inset is initiated or closed.

Note

This function does not work when mfrow is used in par().

Examples

```
mtq <- mf_get_mtq()
mf_map(mtq)
mf_inset_on(x = mtq[1, ], cex = .2)
mf_map(mtq[1, ])
mf_inset_off()
```

```
mf_map(mtg)
mf_inset_on(x = "worldmap", pos = "bottomleft")
mf_worldmap(x = mtg)
mf_inset_off()

mf_map(mtg)
mf_inset_on(fig = c(0, 0.25, 0, 0.25))
mf_map(x = mtg)
mf_inset_off()
```

mf_label

*Plot labels***Description**

Put labels on a map.

Usage

```
mf_label(
  x,
  var,
  col,
  cex = 0.7,
  overlap = TRUE,
  lines = TRUE,
  halo = FALSE,
  bg,
  r = 0.1,
  ...
)
```

Arguments

x	object of class <code>sf</code>
var	name(s) of the variable(s) to plot
col	labels color
cex	labels cex
overlap	if FALSE, labels are moved so they do not overlap.
lines	if TRUE, then lines are plotted between x,y and the word, for those words not covering their x,y coordinate
halo	If TRUE, then a 'halo' is printed around the text and additional arguments <code>bg</code> and <code>r</code> can be modified to set the color and width of the halo.
bg	halo color
r	width of the halo
...	further text arguments.

Value

No return value, labels are displayed.

Examples

```
mtq <- mf_get_mtg()
mf_map(mtg)
mf_label(
  x = mtq, var = "LIBGEO", halo = TRUE, cex = 0.8,
  overlap = FALSE, lines = FALSE
)
```

mf_layout

Plot a map layout

Description

Plot a map layout (title, credits, scalebar, north arrow, frame).

This function uses [mf_title](#), [mf_credits](#), [mf_scale](#) and [mf_arrow](#) with default values.

Usage

```
mf_layout(
  title = "Map Title",
  credits = "Authors & Sources",
  scale = TRUE,
  arrow = TRUE,
  frame = FALSE
)
```

Arguments

title	title of the map
credits	credits
scale	display a scale bar
arrow	display an arrow
frame	display a frame

Value

No return value, a map layout is displayed.

Examples

```
mtq <- mf_get_mtg()
mf_map(mtg)
mf_layout()
```

`mf_legend`*Plot a legend*

Description

Plot all types of legend. The "type" argument defines the legend type:

- **prop**, for proportional symbols maps, see [mf_legend_p](#) for arguments, default values and details;
- **choro**, for choropleth maps, see [mf_legend_c](#) for arguments, default values and details;
- **typo**, for typology maps, see [mf_legend_t](#) for arguments, default values and details;
- **symb** for symbols maps, see [mf_legend_s](#) for arguments, default values and details;
- **prop_line**, for proportional lines maps, see [mf_legend_pl](#) for arguments, default values and details;
- **grad_line** for graduated lines maps, see [mf_legend_gl](#), for arguments, default values and details.

Usage

```
mf_legend(  
  type,  
  pos,  
  val,  
  pal,  
  col,  
  inches,  
  lwd,  
  border,  
  symbol,  
  pt_pch,  
  pt_cex,  
  title,  
  title_cex,  
  val_cex,  
  val_rnd,  
  col_na,  
  pt_cex_na,  
  pt_pch_na,  
  no_data,  
  no_data_txt,  
  frame,  
  bg,  
  fg,  
  cex  
)
```

Arguments

type	type of legend; one of "prop", "choro", "typo", "symb", "prop_line", "grad_line"
pos	position. It can be one of 'topleft', 'top', 'topright', 'right', 'bottomright', 'bottom', 'bottomleft', 'left', 'interactive' or a vector of two coordinates in map units (c(x, y))
val	a vector of values
pal	a set of colors or a palette name (from hcl.colors)
col	a color
inches	size of the biggest symbol (radius for circles, half width for squares) in inches.
lwd	line width(s)
border	border color
symbol	type of symbols, 'circle' or 'square'
pt_pch	pch of the symbols (0:25)
pt_cex	cex of the symbols
title	legend title
title_cex	size of the legend title
val_cex	size of the values in the legend
val_rnd	number of decimal places of the values in the legend
col_na	color for missing values
pt_cex_na	cex of the symbols for missing values
pt_pch_na	pch of the symbols for missing values
no_data	if TRUE a 'missing values' box is plotted
no_data_txt	label for missing values
frame	whether to add a frame to the legend (TRUE) or not (FALSE)
bg	background color
fg	foreground color
cex	size of the legend; 2 means two times bigger

Value

No return value, a legend is displayed.

Examples

```
mtq <- mf_get_mtg()
mf_map(mtq)
mf_legend(type = "prop", pos = "topright", val = c(1, 5, 10), inches = .3)
mf_legend(
  type = "choro", pos = "bottomright", val = c(10, 20, 30, 40, 50),
  pal = hcl.colors(4, "Reds 2")
)
mf_legend(
```



```

    type = "typo", pos = "topleft", val = c("A", "B", "C", "D"),
    pal = hcl.colors(4, "Dynamic")
  )
  mf_legend(
    type = "symb", pos = "bottomleft", val = c("A", "B", "C"),
    pt_pch = 21:23, pt_cex = c(1, 2, 2),
    pal = hcl.colors(3, "Dynamic")
  )
  mf_legend(
    type = "grad_line", pos = "top", val = c(1, 2, 3, 4, 10, 15),
    lwd = c(0.2, 2, 4, 5, 10)
  )
  mf_legend(type = "prop_line", pos = "bottom", lwd = 20, val = c(5, 50, 100))

```

mf_map

Plot a map

Description

This is the main function of the package. `mf_map` can be used to plot all types of maps. The three main arguments are: `x` (sf object), `var` (variable to map), and `type` (map type).

Relevant arguments and default values are detailed in specific functions.

Maps types:

- **base**, base maps ([mf_base](#));
- **prop**, proportional symbols maps ([mf_prop](#));
- **choro**, choropleth maps ([mf_choro](#));
- **typo**, typology maps ([mf_typo](#));
- **symb**, symbols maps ([mf_symb](#));
- **grad**, graduated symbols maps ([mf_grad](#));
- **prop_choro**, proportional symbols maps with symbols colors based on a quantitative data classification ([mf_prop_choro](#));
- **prop_typo**, proportional symbols maps with symbols colors based on qualitative data ([mf_prop_typo](#));
- **symb_choro**, symbols maps with symbols colors based on a quantitative data classification ([mf_symb_choro](#)).

Usage

```

mf_map(
  x,
  var,
  type = "base",
  breaks,
  nbreaks,
  pal,

```

```

alpha = 1,
inches,
val_max,
symbol,
col,
lwd_max,
val_order,
pch,
cex,
border,
lwd,
col_na,
cex_na,
pch_na,
leg_pos,
leg_title,
leg_title_cex,
leg_val_cex,
leg_val_rnd,
leg_no_data,
leg_frame,
add,
...
)

```

Arguments

x	object of class sf or sfc
var	name(s) of the variable(s) to plot
type	one of "base", "prop", "choro", "typo", "symb", "grad", "prop_choro", "prop_typo", "symb_choro"
breaks	either a numeric vector with the actual breaks, or a classification method name (see mf_get_breaks)
nbreaks	number of classes
pal	a set of colors or a palette name (from hcl.colors)
alpha	if pal is a hcl.colors palette name, the alpha-transparency level in the range [0,1]
inches	size of the biggest symbol (radius for circles, half width for squares) in inches.
val_max	maximum value used for proportional symbols
symbol	type of symbols, 'circle' or 'square'
col	color
lwd_max	line width of the largest line
val_order	values order, a character vector that matches var modalities
pch	pch (point type) for symbols
cex	cex (point size) for symbols

<code>border</code>	border color
<code>lwd</code>	border width
<code>col_na</code>	color for missing values
<code>cex_na</code>	cex (point size) for NA values
<code>pch_na</code>	pch (point type) for NA values
<code>leg_pos</code>	position of the legend, one of 'topleft', 'top', 'topright', 'right', 'bottomright', 'bottom', 'bottomleft', 'left' or a vector of two coordinates in map units (c(x, y)). If <code>leg_pos = NA</code> then the legend is not plotted. If <code>leg_pos = 'interactive'</code> click on the map to choose the legend position.
<code>leg_title</code>	legend title
<code>leg_title_cex</code>	size of the legend title
<code>leg_val_cex</code>	size of the values in the legend
<code>leg_val_rnd</code>	number of decimal places of the values in the legend
<code>leg_no_data</code>	label for missing values
<code>leg_frame</code>	whether to add a frame to the legend (TRUE) or not (FALSE)
<code>add</code>	whether to add the layer to an existing plot (TRUE) or not (FALSE)
<code>...</code>	further parameters from plot for sfc objects

Value

x is (invisibly) returned.

Examples

```
mtq <- mf_get_mtq()
mf_map(mtq)
mf_map(mtq, var = "POP", type = "prop")
mf_map(mtq, var = "MED", type = "choro")
mf_map(mtq, var = "STATUS", type = "typo")
mf_map(mtq)
mf_map(mtq, var = "STATUS", type = "symb")
mf_map(mtq)
mf_map(mtq, var = "POP", type = "grad")
mf_map(mtq)
mf_map(mtq, var = c("POP", "MED"), type = "prop_choro")
mf_map(mtq)
mf_map(mtq, var = c("POP", "STATUS"), type = "prop_typo")
mf_map(mtq)
mf_map(mtq, var = c("STATUS", "MED"), type = "symb_choro")
```

mf_raster

Plot a raster

Description

Plot a raster object (SpatRaster from terra).

Usage

```
mf_raster(x, add = FALSE, ...)
```

Arguments

x	a SpatRaster
add	whether to add the layer to an existing plot (TRUE) or not (FALSE).
...	bgamma, smooth, maxcell or other arguments passed to be passed to plotRGB or plot

Value

No return value, a map is displayed.

Examples

```
if (require("terra")) {  
  r <- rast(system.file("ex/elev.tif", package = "terra"))  
  mf_raster(r)  
}
```

mf_scale

Plot a scale bar

Description

Plot a scale bar.

Usage

```
mf_scale(size, pos = "bottomright", lwd = 1.5, cex = 0.6, col, unit = "km")
```

Arguments

size	size of the scale bar in units (default to km). If size is not set, an automatic size is used (1/10 of the map width)
pos	position. It can be one of 'bottomright', 'bottomleft', 'interactive' or a vector of two coordinates in map units (c(x, y)).
lwd	width of the scale bar
cex	cex of the text
col	color
unit	units used for the scale bar. Can be "mi" for miles, "m" for meters, or "km" for kilometers (default)

Value

No return value, a scale bar is displayed.

Note

This scale bar is not accurate on unprojected (long/lat) maps.

Examples

```
mtq <- mf_get_mtg()
mf_map(mtg)
mf_scale()
```

mf_shadow

Plot a shadow

Description

Plot the shadow of a polygon layer.

Usage

```
mf_shadow(x, col = "grey50", cex = 1, add = FALSE)
```

Arguments

x	an sf or sfc polygon object
col	shadow color
cex	shadow extent
add	whether to add the layer to an existing plot (TRUE) or not (FALSE)

Value

x is (invisibly) returned.

Examples

```
mtq <- mf_get_mtq()
mf_shadow(mtq)
mf_map(mtq, add = TRUE)
```

mf_theme

Set a theme

Description

This function set a map theme. The parameters set by this function are the figure margins, background and foreground colors and some [mf_title](#) options.

Usage

```
mf_theme(x = "default", bg, fg, mar, tab, pos, inner, line, cex, font)
```

Arguments

x	name of a map theme. One of "default", "brutal", "ink", "dark", "agolalight", "candy", "darkula", "iceberg", "green", "nevermind", "jsk", "barcelona". If x is used other parameters are ignored.
bg	background color
fg	foreground color
mar	margins
tab	if TRUE the title is displayed as a 'tab'
pos	position, one of 'left', 'center', 'right'
inner	if TRUE the title is displayed inside the plot area.
line	number of lines used for the title
cex	cex of the title
font	font of the title

Details

It is also possible to set a custom theme using a list of arguments (see Examples). Use `mf_theme('default')` to reset theme settings. `mf_theme()` returns the current theme settings.

Value

The (invisible) list of theme parameters is returned.

Examples

```
mtq <- mf_get_mtg()

# built-in theme
mf_theme("green")
mf_map(mtg)
mf_title()

# theme from arguments
mf_theme(
  bg = "darkslategrey", fg = "cornsilk3", mar = c(2, 2, 4, 2),
  tab = FALSE, pos = "center", inner = FALSE,
  line = 2, cex = 2, font = 4
)
mf_map(mtg)
mf_layout()

# theme from list
custom <- list(
  name = "custom",
  bg = "green",
  fg = "red",
  mar = c(2, 2, 2, 2),
  tab = TRUE,
  pos = "center",
  inner = TRUE,
  line = 2,
  cex = 1.5,
  font = 3
)
mf_theme(custom)
mf_map(mtg)
mf_title()

(mf_theme("default"))
```

mf_title

Plot a title

Description

Plot a title

Usage

```
mf_title(txt = "Map Title", pos, tab, bg, fg, cex, line, font, inner)
```

Arguments

txt	title text
pos	position, one of 'left', 'center', 'right'
tab	if TRUE the title is displayed as a 'tab'
bg	background of the title
fg	foreground of the title
cex	cex of the title
line	number of lines used for the title
font	font of the title
inner	if TRUE the title is displayed inside the plot area.

Value

No return value, a title is displayed.

Examples

```
mtq <- mf_get_mtg()
mf_map(mtg)
mf_title()
```

mf_worldmap

Plot a point on a world map

Description

Plot a point on a world map.

Usage

```
mf_worldmap(
  x,
  lon,
  lat,
  water_col = "lightblue",
  land_col = "grey60",
  border_col = "grey40",
  border_lwd = 0.8,
  ...
)
```


Arguments

x	object of class sf or sfc
lon	longitude
lat	latitude
water_col	color of the water
land_col	color of the land
border_col	color of the borders
border_lwd	width of the borders
...	further parameters related to the plotted point aspect (cex, pch, col...)

Value

No return value, a world map is displayed.

Note

The main part of the code is stolen from @fzenoni (<https://gist.github.com/fzenoni/ef23faf6d1ada5e4a91c9ef23b0>)

Examples

```
mtq <- mf_get_mtg()
mf_worldmap(mtg)
mf_worldmap(lon = 24, lat = 39)
mf_worldmap(
  lon = 106, lat = 26,
  pch = 4, lwd = 3, cex = 2, col = "tomato4",
  water_col = "#232525", land_col = "#A9B7C6",
  border_col = "white", border_lwd = 1
)
```

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