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Suggests RColorBrewer, classInt, rgdal, rgeos, geosphere, knitr, markdown

Enhances tools, geonames, XML

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Description A minimal, light-weight set of tools for producing nice looking maps in R, with support for map projections. For details see Brown (2016) <doi:10.32614/RJ-2016-005>.

License GPL

VignetteBuilder knitr

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`col2html` *Convert colours to HTML hex*

Description

Converts any object interpretable as a colour to an HTML hex string, i.e. 'red' to '#FF0000'.

Usage

```
col2html(col, opacity=1, alpha)
```

Arguments

`col`	Either a character vector of colour names as listed by `colours()` or an integer vector of colour indexes. Passed to `col2rgb`.
`opacity`	scalar or vector of colour opacities between 0 and 1.
`alpha`	Integer between 0 and 255, or a character giving a 2-digit hex value. Overrides `opacity` and passed to `rgb`.

Value

A vector of 6 or 8 digit hex codes specifying HTML colours.

See Also

`col2rgb`,`rgbhexmode`

Examples

```
col2html(1:10)
col2html(c('red','blue'),0.5)
col2html(c(2,4),0.5)
col2html(c(stuff='red',foo='blue'),alpha=128)
col2html(c('red','blue'),alpha='80')
col2html(c(2,4),alpha='80')

N = length(palette())
plot(1:N, rep(1,N),xlim=c(0,N),pch=16,cex=5,
col=col2html(1:N))
points(1:N, rep(1,N),pch=15,cex=4.5, col=palette())
text(-0.5+1:10, rep(1,10), col2html(1:10),srt=90)
text(1:N, rep(0.7,N), palette())
text(1:N-0.5, rep(1.3, N), col2html(palette()), cex=0.7)
```

`colourScale` *Create colour scales*

Description

Produces a scale of colours for plotting maps

Usage

```
colourScale(x, breaks=5, style=c("quantile","equal","unique", "fixed"),
 col="YlOrRd", opacity=1, dec=NULL, digits = 6, firstBreak=NULL,
 transform=NULL, revCol=FALSE, exclude=NULL, labels=NULL, ...)
colorScale(...)
breaksForRates(x, breaks = 10, transform = 0.1,
     multiples = c(2, 4, 5, 10))
```

Arguments

`x`	A vector or single-layer Raster, numeric or factor, for which a colour scale will be created
`breaks`	For `colourScale` either the number of or vector of breaks. for `legendBreaks` usually the output of `colourScale`, or a vector of breaks
`style`	Style for breaks, see Details
`col`	Colours to use, either a function or argument for `brewer.pal`
`opacity`	adds transparency to colours, either a single number, vector of length 2, or vector of same length as `breaks`
`dec`	Number of decimal places for the breaks
`digits`	Number of significant figures
`firstBreak`	If non-null, force the first break to take this value (often zero).

transform	A list of two functions to transform x and inverse transform the breaks, or a numeric value specifying a Box-Cox parameter.
revCol	Reverse the order of the colours.
exclude	A vector of values to change to NA when they appear in x
labels	Vector of names of levels, useful when style='unique'
multiples	break points must be multiples of these numbers times a power of 10
...	Additional arguments passed to classIntervals.

Details

colourScale produces intervals from x, each with a unique colour. Categories are determined with break points according to the following style options:

- quantile: quantile(x, prob=seq(0,1,len=breaks),)

equal: seq(min(x), max(x), len=breaks)

unique: sort(table(unique(x)))[1:breaks]

fixed: breaks

any other string: is passed to classIntervals

colorScale passes all it's arguments to colourScale

breaksForRates returns break points suitable for mapping incidence rates, which are positive and always include 1.0.

Value

A list with elements

plot	Vector of same length of x containing colours (RGB hex)
breaks	vector of break points
col	vector of unique colour values corresponding to breaks
colWithOpacity	as col, but with two digit transparency values appended.

See Also

legendBreaks,scaleBar, classIntervals

Examples

```
breaksForRates(13.6, breaks = 7)

Npoints = 20
myPoints = SpatialPointsDataFrame(20*cbind(runif(Npoints), runif(Npoints)),
 data=data.frame(y1=c(NA, rnorm(Npoints-1)),
 y2=c(sample(1:4, Npoints-1,replace=TRUE), NA)),
 proj4string=mapmisc::crsLL)

## Not run:
```

```
mymap = openmap(myPoints)

## End(Not run)

if(require('RColorBrewer', quietly=TRUE)) {
 theCol = 'RdYlBu'
} else {
 theCol = heat.colors
}

myscale = colourScale(myPoints$y1, breaks=4, col=theCol,
 style="quantile", revCol=TRUE,dec=1)



map.new(myPoints)
## Not run:
plot(mymap,add=TRUE)

## End(Not run)
plot(myPoints, col=myscale$plot, pch=16,add=TRUE)
legendBreaks("topleft", breaks=myscale)


myscale2 = colourScale(myPoints$y1, breaks=8, col=rainbow, style="equal",
opacity=0.8, dec=2, revCol=TRUE)

map.new(myPoints)
## Not run:
plot(mymap,add=TRUE)

## End(Not run)
plot(myPoints, col=myscale2$plot, pch=16,add=TRUE)
legendBreaks("topleft", breaks=myscale2)

if(require('RColorBrewer', quietly=TRUE)) {
 theCol = 'Set2'
} else {
 theCol = heat.colors
}

myscale3 = colourScale(myPoints$y2,  breaks=3,col=theCol, style="unique",
 opacity=c(0.1, 0.9))

map.new(myPoints)
## Not run:
plot(mymap,add=TRUE)

## End(Not run)
plot(myPoints, col=myscale3$plot, pch=16,add=TRUE)
legendBreaks("topleft", breaks=myscale3)

myPoints$y3 = exp(myPoints$y1)
```

```
myscale4 = colourScale(myPoints$y3,  breaks=4, style="equal",
 opacity=c(0.1, 0.9), transform=1.25,dec=0, firstBreak=0)

map.new(myPoints)
## Not run:
plot(mymap,add=TRUE)

## End(Not run)
plot(myPoints, col=myscale4$plot, pch=16,add=TRUE)
legendBreaks("topleft", legend=myscale4$breaks, col=myscale4$col)
```

---

crsMerc *Spherical Mercator projection*

Description

Defines CRS's for the Spherical Mercator and long-lat projections.

Usage

```
crsMerc
crsLL
```

Details

CRS objects for epsg:4326 (long-lat) and the spherical Mercator projection used by web mapping services. Using epsg codes requires the `rgdal` package to be installed, and `crsLL` is intended as a replacement for `CRS("+init=epsg:4326")` when `rgdal` is not guaranteed to be available.

Value

Objects of class CRS.

References

https://en.wikipedia.org/wiki/Web_Mercator, https://spatialreference.org/ref/epsg/4326/

See Also

CRS, showEPSG

Examples

```
crsMerc
if(require('rgdal', quietly=TRUE))
 CRS("+init=epsg:3857")

crsLL
if(require('rgdal', quietly=TRUE)) {
 CRS("+init=epsg:4326")

 rgdal::showEPSG("+proj=longlat")
 rgdal::showEPSG(as.character(crsLL))
}
```

---

geocode *Georeferencing with Google*

Description

Uses the dismo package to geocode with Google

Usage

```
geocode(x, extent,
  lang = gsub("(_|[:]).*", "", Sys.getenv('LANGUAGE')))
```

Arguments

x	Vector of character strings to search for
extent	Currently unused. an Extent object, or any object from which an Extent can be obtained.
lang	Language for place names in result.

Details

If the option `getOption('mapmiscCachePath')` is set, it will be used to specify the folder to save downloaded data. `getOption('mapmiscVerbose')` for printing progress.

Data are retreived from Openstreetmap.org, see https://wiki.openstreetmap.org/wiki/Nominatim.

Value

A `SpatialPointsDataFrame` with coordinates in the projection of `extent` if possible, or long-lat otherwise.

Examples

```
cities=try(mapmisc::geocode('Ulan batar'), silent=TRUE)
data('worldMap', package='mapmisc')

if(
 !all(class(cities) == 'try-error') & requireNamespace("rgdal", quietly = TRUE)
 ) {
citiesT = spTransform(cities, crs(worldMap))
mapmisc::map.new(citiesT, buffer=5000*1000)
plot(worldMap, add=TRUE)
points(citiesT, col='red')
text(citiesT, labels=citiesT$name, col='red',pos=4)

}
```

GNcities *Retrieve city names and locations*

Description

This function uses the geonames package to provide city names and locations from www.geonames.org.

Usage

```
GNcities(north, east, south, west, lang = "en", maxRows = 10, buffer=0)
GNsearch(..., crs=crsLL)
```

Arguments

north	A bounding box or SpatialPoints or SpatialPolygons or Extent or Raster object, or a decimal degree of longitude.
east, south, west	If north is numeric, decimal degree bounding box.
lang	Language for internationalised returned text
maxRows	Limit on returned rows
buffer	passed to codeextend
...	Various search arguments
crs	projection for the output

Value

A SpatialPointsDataFrame with the sampe projection north if it exists, otherwise in long-lat.

See Also

GNcities, GNsearch

Examples

```
myraster = raster(matrix(0,10,10),xmn=8,xmx=18,ymn=0,ymx=10,
 crs=mapmisc::crsLL)
values(myraster) = seq(0,1,len=ncell(myraster))
myPoints = SpatialPoints(myraster, proj4string=CRS(proj4string(myraster)))[
 seq(1,ncell(myraster),len=5)]

## Not run:

if (requireNamespace("geonames", quietly = TRUE)) {
cities=GNcities(myPoints, max=5)
mytiles = openmap(myraster)

map.new(cities)
plot(mytiles, add=TRUE)
points(cities, col='red')
text(cities, labels=cities$name, col='red',pos=4)


cities=GNcities(myraster, max=5)

map.new(cities)
plot(mytiles, add=TRUE)
points(cities, col='red')
text(cities, labels=cities$name, col='red',pos=4)

mapmisc::GNsearch(q="Toronto Ontario")
}

## End(Not run)
```

---

gridlinesWrap *Adds long-lat grid for projected data*

Description

long-lat grid lines are added to a map in the coordinate system specified, allowing for map projections wrapped differently from the 180 meridian.

Usage

```
gridlinesWrap(crs,
  easts=seq(-180,180,by=60),
```

```
  norths=seq(-90,90,by=30),
  ndiscr=40, plotLines=TRUE,
  plotLabels = TRUE, ...)
```

Arguments

crs	A CRS object, proj4 string, or an object from which a projection can be extracted with proj4string(crs)
easts	vector of longitudes
norths	vector of latitudes
ndiscr	number of intermediate points per line
plotLines	add lines to existing plot
plotLabels	add labels to existing plot
...	Additional arguments passed to lines or text, for example lty=2

Author(s)

Patrick Brown

See Also

gridlines, llgrid

Examples

```
## Not run:
Npoints = 20
myPoints = SpatialPointsDataFrame(
 cbind(
 runif(Npoints, -15000000, 15000000),
 runif(Npoints, -8000000, 8000000)),
 data=data.frame(y1=c(NA, rnorm(Npoints-1)),
 y2=c(sample(0:5, Npoints-1,replace=TRUE), NA)),
 proj4string=moll(c(-100,0))
)


plot(myPoints)
gridlinesWrap(myPoints, lty=3, col='red')

## End(Not run)
```

legendBreaks *Legends for colour scale*

Description

Legends where N+1 labels are supplied as the limits of N bins.

Usage

```
legendBreaks(pos,
 breaks,
 col,    legend,
    rev=TRUE,
    outer=TRUE,
    pch=15,
    bg='white',
    cex=par('cex'),
    pt.cex=2.5*cex,
    text.col=par('fg'),
    title=NULL,
    inset=0.05,
    title.col=text.col,
    adj=0,
    width=Inf,
    lines=Inf,
    y.intersp,
 ...)
```

Arguments

pos	Position, as specified in the legend function.
breaks	Optional list with elements col and legend, such as the output from colourScale
col	Single colour or vector of colours for each bin
legend	vector of labels for the legend, one more element than there are colours
rev	if TRUE, labels and colours are ordered from bottom to top, otherwise top to bottom.
outer	If TRUE, put legend in the margin of the plot
pch	see legend
bg	background colour see legend
cex	see legend
pt.cex	see legend
text.col	see legend
title	see legend

inset	see legend
title.col	see legend
adj	Adjustment of the legend labels relative to plotting symbols.
width	Maximum number of characters before a line break is added to the legend labels
lines	Maximum number of lines in each legend label
y.intersp	see legend
...	Additional arguments passed to legend.

Details

A legend for 'z-axis' colour scales.

Value

Result of call to legend

See Also

colourScale

---

legendTable *Table for colour scales*

Description

A table in html or Latex showing values associated with colours

Usage

```
legendTable(x,
    type=c('latex',  'html'),
    box = c(-0.2, 1, 2),
    unit = 'em',
    collapse=NULL)
```

Arguments

x	a data.frame with columns col and label, possibly produced by colourScale
type	html or latex compatible output
box	dimensions of colour boxes, passed as depth, height and width to rule in Latex, or width (first two elements ignored) for html.
unit	Units for box dimensions
collapse	If non-NULL, passed to paste to produce a character vector instead of table

Value

data.frame or character vector

See Also

colourScale

Examples

```
mytable = data.frame(col=col2html(1:5), label=1:5)

legendTable(mytable)
legendTable(mytable, collapse=';')
legendTable(mytable, type='html')
```

---

map.new *Start a new map*

Description

Prepare a plotting window suitable for a map

Usage

```
map.new(x,legendRight=FALSE, buffer=0, mar=c(0,0,0,0), ...)
```

Arguments

x	A spatial object from which an extent can be extracted.
legendRight	Leave room to the right for the legend produced by plotting a Raster object
buffer	passed to extend to increase the plotting area
mar	see par
...	Additional arguments passed to plot

Details

map.new initiates a plot intended to contain a map covering the extent of x, with no margins.

Author(s)

Patrick Brown

See Also

scalebar, spplot

Examples

```
Npoints = 20
myPoints = SpatialPointsDataFrame(
 cbind(runif(Npoints), 51+runif(Npoints)),
 data=data.frame(y1=c(NA, rnorm(Npoints-1)),
 y2=c(sample(0:5, Npoints-1,replace=TRUE), NA)),
 proj4string=mapmisc::crsLL)

map.new(myPoints, legendRight=TRUE, mar=c(3,3,0,0), buffer=0.2)
points(myPoints)
legendBreaks('right', list(breaks=1:3, col=1:2))
```

---

modis *MODIS tiles and projection*

Description

Raster containing MODIS tile ID's

Usage

```
getModisTiles(x, tiles = mapmisc::modisRaster)
crsModis
modisRaster
degreeRaster
```

Arguments

x	A spatial object which modis tiles will cover.
tiles	A raster with modis (or other) tiles.

Details

`getModisTiles` returns a matrix with modis tiles.

`modisRaster` shows horizontal and vertical tile names for downloading data from MODIS at, for example, http://e4ftl01.cr.usgs.gov/MOTA.

`degreeRaster` shows horizontal and vertical tiles in long-lat, for downloading elevation.

References

https://nsidc.org/data/docs/daac/mod10_modis_snow/landgrid.html, https://spatialreference.org/ref/sr-org/modis-sinusoidal/

Examples

```
crsModis

myPointLL = SpatialPoints(cbind(c(5:6),10:11), proj4string = crsLL)

if(requireNamespace("rgdal", quietly=TRUE)) {
  getModisTiles(myPointLL)

  getModisTiles(myPointLL, mapmisc::degreeRaster)
}


modisUrl =  'https://e4ftl01.cr.usgs.gov/MOTA/MCD12Q1.006/2002.01.01/'

## Not run:
theFiles =  grep(
  paste0("(",paste(getModisTiles(myPointLL)[,'tile'], collapse='|'), ").*.hdf$"),
 XML::getHTMLLinks(RCurl::getURL(
     modisUrl,ftp.use.epsv=FALSE,
     dirlistonly = TRUE)), value=TRUE)
paste0(modisUrl, theFiles)

## End(Not run)
```

`netherlands` *Data from the Netherlands*

Description

Elevation data and map tiles for the Netherlands

Usage

```
data("netherlands")
```

Format

`nldElev` is a raster of elevation `nltTiles` is a background map `nldCities` is a SpatialPoints-DataFrame of city locations.

Details

The inclusion of these datasets is intended to allow the package to build when an internet connection is not present.

Source

See examples.

See Also

meuse, getData, openmap

Examples

```
# soil data
library("sp")
data("meuse")
coordinates(meuse) <- ~x+y

#  proj4string(meuse) <- CRS("+init=epsg:28992")
 proj4string(meuse) <- CRS(
  paste("+proj=sterea +lat_0=52.15616055555555 +lon_0=5.38763888888889",
    "+k=0.9999079 +x_0=155000 +y_0=463000 +ellps=bessel +units=m",
    "+no_defs +datum=WGS84")
 )

meuse$soilFac = factor(meuse$soil, levels=c(1,2,3),
 labels=c("Calcareous","Non-Calc's","Red Brick"))
soilCol = colourScale(meuse$soilFac)

data("netherlands")

map.new(meuse)
plot(nldTiles,add=TRUE)
points(nldCities)
text(nldCities,label=nldCities$name, pos=2)
points(meuse, pch=16, col=soilCol$plot)
legend('topleft', fill=soilCol$col,legend=soilCol$legend)
if(requireNamespace('rgdal', quietly=TRUE)) insetMap(meuse, "bottomright",map=world)

# location won't be marked on the inset map unless rgdal is available

## Not run:
# this is how the data were obtained

# map tiles
nldTiles = openmap(meuse,  zoom=12)

# cities
nldCities = GNcities(nldTiles, maxRows=25)

# world
world = openmap(extent(-10,30,40,60))

# elevation data
require('rgdal')
meuseLL = spTransform(meuse, mapmisc::crsLL)
getData("SRTM", lon=xmin(extent(meuseLL)),
 lat=ymin(extent(meuseLL)),path=tempdir())
nldElev = raster(paste(tempdir(), "/", "srtm_38_02.tif", sep=""))
nldElev = crop(nldElev, extend(extent(meuseLL), 0.1))
```

```
nldElev = projectRaster(nldElev, crs=proj4string(meuse))
nldElev = crop(nldElev, extent(nldTiles))

# save the files where the package builder wants them
# save(nldElev, nldTiles, nldCities,world,
 #  file="~/research/diseasemapping/pkg/mapmisc/data/netherlands.RData",
 #  compress="xz")

## End(Not run)
```

---

omerc *Oblique Mercator, Cylindrical, and Mollweide projections*

Description

Defines an appropriate Oblique Mercator, Oblique Cylindrical Equal Area, and Mollweide projections for a supplied Spatial object

Usage

```
omerc(x, angle,
post=c('none', 'north', 'wide','tall'),
   preserve=NULL)
   ocea(x, angle, flip=FALSE)
   moll(x=0, angle=NULL, flip=FALSE)
```

Arguments

x	A SpatialP* object or a vector of length 2 giving the centroid of the projection.
angle	angle of rotation or vector of angles
post	post-projection angle rotation
flip	post-projection flipping of coordinates
preserve	A SpatialPoints object, the resulting projection is scaled so as to preserve the distances between these points as best as possible.

Details

With omerc, an Oblique Mercator map projection is produced which warps the world onto a cylinder, with the north-south axis rotated by the specified angle. If angle is a vector, the optimal angle for reducing the size of the bounding box is returned.

If post = 'north', an inverse rotation will preserve the north direction at the origin.

If post = 'wide', an inverse rotation makes the smallest possible bounding box which is wider than tall.

If post = 'tall', the bounding box is taller than it is wide

If post is numeric, it specifies an angle for inverse rotation.

ocea produces an Oblique Cylindrical Equal Area projection and moll a Mollweide projections

Value

An object of class CRS.

References

https://en.wikipedia.org/wiki/Space-oblique_Mercator_projection/

See Also

CRS-class,spTransform

Examples

```
omerc(c(10,50), angle=c(0,45,80))

data('netherlands')

if(require('rgdal', quietly=TRUE)){
nldUtm = spTransform(nldCities,
 omerc(nldCities, angle=0))
projection(nldUtm)

map.new(nldUtm)
text(nldUtm,labels=nldUtm$name)
scaleBar(nldUtm, 'topright')

nldRot = spTransform(nldCities,
omerc(nldCities, angle=seq(25,45,by=5))
)
projection(nldRot)

map.new(nldRot)
text(nldRot,labels=nldRot$name)
scaleBar(nldRot, 'topright')
insetMap(nldRot, 'bottomright',map=world)

}
## Not run:

 nldOceaCrs = ocea(nldCities)
 nldOcea = spTransform(nldCities, nldOceaCrs)
 map.new(nldOcea, buffer=2000)
 text(nldOcea,labels=nldOcea$name)
 scaleBar(nldOcea, 'topright')

 map.new(nldCities)
 plot(nldTiles,add=TRUE)
 text(nldCities,labels=nldCities$name)

 tilesRot = openmap(nldRot)
 map.new(nldRot)
 plot(tilesRot,add=TRUE)
```

```
text(nldRot,labels=nldRot$name)

tilesUtm = openmap(nldUtm)
map.new(nldUtm)
plot(tilesUtm,add=TRUE)
text(nldUtm,labels=nldUtm$name)


## End(Not run)
```

---

openmap *Download map tiles*

Description

Downloads map tiles from Openstreetmap.org and other servers.

Usage

```
openmap(x, zoom,
  path="http://tile.openstreetmap.org/",
  maxTiles = 9,
  crs=raster::crs(x),
  buffer=0, fact=1,
 verbose=getOption('mapmiscVerbose'),
  cachePath=getOption('mapmiscCachePath')
)

osmTiles(name, xyz, suffix)

openmapAttribution(name,
  type=c('text','latex','markdown','html', 'auto'),
  short=FALSE)
```

Arguments

x	An extent or any spatial object (raster, Spatial*) from which an extent can be obtained.
zoom	the zoom level, when missing it will be determined by maxTiles.
path	Source of map tiles, see http://diseasemapping.r-forge.r-project.org/mapLayers.html.
maxTiles	If zoom is missing, zoom will be chosen such that the number of map tiles is less than or equl to this number.
crs	Projection for the output, defaulting to the same projection as x. If x has no projection, for instance when x is a matrix or extent, crs is also used as the projection of x. If crs is NA or missing and x has no crs, long-lat is used.

buffer	Extend the extent for which the map is requested, in units of x. Can be negative, or a vector of length 2 for different x and y extensions
fact	Passed to disaggregate before reprojecting if fact>1, helps to produce a clearer image.
verbose	Print information about map images being downloaded, defaults to FALSE.
cachePath	Location to store downloaded map images, defaults to tempdir()
name	name of a tile path, if missing a vector of all available tile paths is returned. name can be any of the names of the vector returned when name is unspecified.
type	format for the attribution
short	short or long attribution
xyz	format of xyz coordinates in URL's
suffix	string to append to URL's, i.e. '.png'

Details

These functions download, display, and manipulate map tiles stored in a standard way either on a web server or a local folder.

Map tiles are a set of PNG images that span the world at a set of zoom levels. Zoom level 1 has four 256x256 pixel tiles in a 2x2 pattern over the whole world. In general, zoom level n has 2^n by 2^n tiles. Zoom levels go up to about 17 or 18 depending on the tile server.

See http://diseasemapping.r-forge.r-project.org/mapLayers.html for a full set of map tiles.

Be sure to attribute any maps you publish, the osmAttribution function will assist. If type = 'auto' then markdown format will be used unless a variable mdToTex is defined and equal to TRUE.

Value

openmap returns a Raster with indexed colours, or a RasterBrick brick, with 'red', 'green' and 'blue' layers.

openmapAttribution returns a character string.

Examples

```
data("netherlands")

plot(nldTiles)

openmapAttribution(nldTiles, short=TRUE, type='markdown')

openmapAttribution("stamen-toner", type='text')


myraster = raster(matrix(0,10,10),xmn=8,xmx=18,ymn=0,ymx=10,
  crs=mapmisc::crsLL)

values(myraster) = seq(0,1,len=ncell(myraster))
```

```
myPoints = SpatialPoints(myraster, proj4string=CRS(proj4string(myraster)))[
 seq(1,ncell(myraster),len=5)]

names(osmTiles())


## Not run:
 mytiles = openmap(myraster, zoom=6)

 map.new(myraster)
 plot(mytiles, add=TRUE)
 points(myPoints,col='red')

 mytiles = openmap(myPoints,
  path='waze', verbose=TRUE)
 map.new(myPoints)
 plotRGB(mytiles, add=TRUE)
 points(myPoints, col='red')
 openmapAttribution(mytiles)

## End(Not run)
```

`persistentCache` *Set a persistent cache*

Description

Sets a cache folder in temporary space

Usage

```
persistentCache(verbose=TRUE)
```

Arguments

`verbose`	print location of the cache folder

Details

The default cache for map images is tempdir()/mapmiscCache, which will be deleted when an R session ends. Running this function sets a cache in /tmp/mapmiscCache_[username], which will re-use cached data across R sessions.

Examples

```
# current cache
getOption("mapmiscCachePath")

# set a new cache
myCache = file.path(tempdir(), 'myCache')
dir.create(myCache)
options(mapmiscCachePath = myCache)
getOption("mapmiscCachePath")

# create a persistent cache
## Not run:
persistentCache(verbose=TRUE)

## End(Not run)
getOption("mapmiscCachePath")
```

`scaleBar` *Scale bar and inset map*

Description

Utilities for plotting a map, adding a scale bar and north arrow, and adding a legend of colour scales.

Usage

```
scaleBar(crs, pos = "bottomright",
 cex=1,
    pt.cex = 1.1*cex,
    seg.len=5*cex,
    title.cex=cex,
    outer=TRUE,...)
insetMap(crs, pos="bottomright",map="osm",zoom=0,
  width=max(c(0.2, 1-par('plt')[2])),
  col="#FF000090", borderMap=NULL,
   cropInset = extent(-180,xmax=180, ymin=-47, ymax=71),
   outer=TRUE, ...)
```

Arguments

`crs`	A `CRS` object, proj4 string, or an object from which a projection can be extracted with `proj4string(crs)`
`pos`	Position, as specified in the `legend` function.
`cex`	scaling factor for the legend
`pt.cex`	Scaling factor north arrow (can be zero).
`seg.len`	approximate length (in character units) of the scale bar. can be zero.

title.cex	scaling for the distance text
outer	If TRUE, put bar or map in the margin of the plot
map	Either a Raster for the inset map or a string passed to openmap's path argument
zoom	Zoom level if retrieving inset map from openmap
width	Width of the inset map, as a fraction of the plot window
col	Colour for shaded region of inset map
borderMap	border style for the inset map (passed to polygon)
cropInset	Crop the insert map to this extent
...	Additional arguments passed to legend for scaleBar or polygon (for insetMap).

Details

scaleBar produces a scale bar reflecting the distance travelling on a great circle from the centre of the plot and travelling to the right. The length of the bar is the width of 6 characters times scale.cex.

Author(s)

Patrick Brown

See Also

scalebar, spplot

Examples

```
Npoints = 20
myPoints = SpatialPointsDataFrame(
 cbind(runif(Npoints), 51+runif(Npoints)),
 data=data.frame(y1=c(NA, rnorm(Npoints-1)),
 y2=c(sample(0:5, Npoints-1,replace=TRUE), NA)),
 proj4string=mapmisc::crsLL)

## Not run:
mymap = openmap(myPoints)

## End(Not run)

breaks = c(-100, -1, 1, Inf)
thecol = c('red','orange','blue')


map.new(myPoints)
## Not run:
plot(mymap,add=TRUE)

## End(Not run)
plot(myPoints,col = as.character(cut(
 myPoints$y1, breaks, thecol
```

```
)),add=TRUE)
scaleBar(myPoints, "bottomright",cex=1.25, seg.len=2)
temp=legendBreaks("topleft", legend=breaks, col=thecol)

## Not run:
thedot = insetMap(myPoints, "bottomleft",col='#00000000', lty=0)
points(thedot)

## End(Not run)
```

`tonerToTrans` *Convert RGB maps to semi-transparent*

Description

Stamen-toner maps are 3-layer RGB rasters, which are converted to single-layer rasters with indexed colours with whites becoming transparent.

Usage

```
tonerToTrans(x, pattern="(red|green|blue)$", power = 0.5, col='black', threshold=Inf)
rgbtToIndex(x, pattern="(red|green|blue|trans)$")
```

Arguments

`x`	A `RasterStack` with RGB colours, such as from `openmap` with `path='stamen-toner'`
`pattern`	string passed to `grep` to find RGB layers.
`power`	Values below 1 increase opacity, above 1 increases transparency
`col`	colour for resulting map
`threshold`	colours above this value are transparent

Details

The difference between these functions is that `tonerToTrans` converts white to transparent, whereas `rgbtToIndex` uses the transparency layer. The former is intended for `'stamen-toner'` maps.

Value

A `RasterLayer` with indexed colours

Author(s)

Patrick Brown

See Also

`openmap`

Examples

```
## Not run:

 rgbMap = openmap(c(0,10), zoom=3, path='stamen-toner')
 names(rgbMap)
 plotRGB(rgbMap)

 transMap = tonerToTrans(rgbMap, col='blue')
 names(transMap)
 par(bg='red')
 plot(transMap)

 rgbMap[['stamen.tonerTrans']] = 255-rgbMap[['stamen.tonerRed']]
 rgbtMap = rgbtToIndex(rgbMap)
 plot(rgbtMap)

## End(Not run)
```

---

tpeqd *Two point equidistant and tilted perspective projections*

Description

Defines map projection

Usage

```
tpeqd(x, offset=c(0,0), axis='enu')
tpers(x,  hKm = 100*1000, tilt = -10, offset=c(0,0), axis='enu')
```

Arguments

x	A SpatialPoints* object of length 2 or a matrix with two columns.
hKm	Height veiwing the Earth from
tilt	Viewing angle
offset	2 coordinates to define the origin
axis	defaults to east, north, up. 'swu' would rotateo 90 degrees

Details

A coordinate reference system is returned

Value

An object of class CRS.

References

https://en.wikipedia.org/wiki/Two-point_equidistant_projection/ https://proj.org/operations/projections/tpers.html

See Also

CRS,spTransform

Examples

```
tpeqd(rbind(c(0,0), c(10,50)))

data('netherlands')

tcrs = tpeqd(nldCities[1:2,])
tcrs

if(require('rgdal', quietly=TRUE)) {
nldT = spTransform(nldCities, tcrs)
projection(nldT)

map.new(nldT)
text(nldT,labels=nldT$name)
scaleBar(nldT, 'topright')

}
```

---

worldMap *Country boundaries*

Description

Country borders from naturalearthdata.com

Usage

```
data("worldMap")
```

Source

https://www.naturalearthdata.com/downloads/110m-cultural-vectors/

Examples

```
# soil data
library("mapmisc")

data("worldMap")
myMap = openmap(worldMap, zoom=1, fact=1.5)
map.new(worldMap)
plot(myMap, add=TRUE)
plot(worldMap, border='red', lwd=3, add=TRUE)
plot(worldMap[worldMap$NAME ==  'Brazil',],
 add=TRUE, col='green')
```

`wrapPoly` *Reproject polygons with wrapping*

Description

Reprojects a SpatialPolygons object to a projection with longitude wrapping other than 180 degreess

Usage

```
wrapPoly(x,crs)
```

Arguments

`x`	A Spatial object
`crs`	An object of class `CRS`.

Value

A reprojected Spatial object.

See Also

`spTransform`.

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