Package ‘cartogram’

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Title Create Cartograms with R

Version 0.3.0

Description Construct continuous and non-contiguous area cartograms.

URL https://github.com/sjewo/cartogram

BugReports https://github.com/sjewo/cartogram/issues

Imports methods, sf, packcircles

Suggests

License GPL-3

Encoding UTF-8

RoxygenNote 7.2.3

NeedsCompilation no

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R topics documented:

cartogram_cont *Calculate Contiguous Cartogram Boundaries*

Description

Construct a continuous area cartogram by a rubber sheet distortion algorithm (Dougenik et al. 1985)

Usage

```
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)

## S3 method for class 'sf'
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)
```

Arguments

`x`	a polygon or multiplogyon sf object
`weight`	Name of the weighting variable in x
`itermax`	Maximum iterations for the cartogram transformation, if maxSizeError ist not reached

`maxSizeError` Stop if meanSizeError is smaller than maxSizeError

`prepare` Weighting values are adjusted to reach convergence much earlier. Possible methods are "adjust", adjust values to restrict the mass vector to the quantiles defined by threshold and 1-threshold (default), "remove", remove features with values lower than quantile at threshold, "none", don't adjust weighting values

`threshold` Define threshold for data preparation

`verbose` print meanSizeError on each iteration

Value

An object of the same class as x

References

Dougenik, J. A., Chrisman, N. R., & Niemeyer, D. R. (1985). An Algorithm To Construct Continuous Area Cartograms. In The Professional Geographer, 37(1), 75-81.

Examples

```
library(sf)
library(cartogram)

nc = st_read(system.file("shape/nc.shp", package="sf"), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_cont(nc_utm, weight = "BIR74", itermax = 5)

# Plot
par(mfrow=c(2,1))
plot(nc[,"BIR74"], main="original", key.pos = NULL, reset = FALSE)
plot(nc_utm_carto[,"BIR74"], main="distorted", key.pos = NULL, reset = FALSE)
```

`cartogram_dorling` *Calculate Non-Overlapping Circles Cartogram*

Description

Construct a cartogram which represents each geographic region as non-overlapping circles (Dorling 1996).

Usage

```
cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)

## S3 method for class 'sf'
cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)
```

Arguments

`x` a polygon or multiplogyon sf object

`weight` Name of the weighting variable in x

`k` Share of the bounding box of x filled by the larger circle

`m_weight` Circles' movements weights. An optional vector of numeric weights (0 to 1 inclusive) to apply to the distance each circle moves during pair-repulsion. A weight of 0 prevents any movement. A weight of 1 gives the default movement distance. A single value can be supplied for uniform weights. A vector with length less than the number of circles will be silently extended by repeating the final value. Any values outside the range [0, 1] will be clamped to 0 or 1.

`itermax` Maximum iterations for the cartogram transformation.

Value

Non overlaping proportional circles of the same class as x.

References

Dorling, D. (1996). Area Cartograms: Their Use and Creation. In Concepts and Techniques in Modern Geography (CATMOG), 59.

Examples

```
library(sf)
library(cartogram)

nc = st_read(system.file(”shape/nc.shp”, package=”sf”), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_dorling(nc_utm, weight = ”BIR74”)

# Plot
par(mfrow=c(2,1))
plot(nc[,”BIR74”], main=”original”, key.pos = NULL, reset = FALSE)
plot(nc_utm_carto[,”BIR74”], main=”distorted”, key.pos = NULL, reset = FALSE)
```

cartogram_ncont *Calculate Non-Contiguous Cartogram Boundaries*

Description

Construct a non-contiguous area cartogram (Olson 1976).

Usage

```
cartogram_ncont(x, weight, k = 1, inplace = TRUE)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_ncont(x, weight, k = 1, inplace = TRUE)

## S3 method for class 'sf'
cartogram_ncont(x, weight, k = 1, inplace = TRUE)
```

Arguments

`x` a polygon or multiplogyon sf object

`weight` Name of the weighting variable in x

`k` Factor expansion for the unit with the greater value

`inplace` If TRUE, each polygon is modified in its original place, if FALSE multi-polygons are centered on their initial centroid

Value

An object of the same class as x with resized polygon boundaries

References

Olson, J. M. (1976). Noncontiguous Area Cartograms. In The Professional Geographer, 28(4), 371-380.

Examples

```
library(sf)
library(cartogram)

nc = st_read(system.file("shape/nc.shp", package="sf"), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_ncont(nc_utm, weight = "BIR74")

# Plot
```

```
par(mfrow=c(2,1))
plot(nc[,"BIR74"], main="original", key.pos = NULL, reset = FALSE)
plot(st_geometry(nc_utm), main="distorted", reset = FALSE)
plot(nc_utm_carto[,"BIR74"], add =TRUE)
```

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