Package 'centr'

September 1, 2024

Title Weighted and Unweighted Spatial Centers

Version 0.2.0

Description Generate mean and median weighted or unweighted spatial centers. Functions are analogous to their identically named counterparts within 'ArcGIS Pro'. Median center methodology based off of Kuhn and Kuenne (1962) <doi:10.1111/j.1467-9787.1962.tb00902.x>.

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Encoding UTF-8

RoxygenNote 7.3.2

Imports sf

URL https://ryanzomorrodi.github.io/centr/, https://github.com/ryanzomorrodi/centR

Suggests data.table, knitr, rmarkdown, testthat (>= 3.0.0), tibble, tidycensus

Config/testthat/edition 3

BugReports https://github.com/ryanzomorrodi/centR/issues

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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mean_center *Mean Center*

Description

Mean center calculates the geographic average center. One can specify the groups to calculate individual centers for groups and weights for each individual point. It is analagous to the ArcGIS Pro Mean Center tool.

If `st_is_longlat(x)`, mean center is calculated assuming a spherical Earth. Projected data is calculated assuming a "flat" Earth.

Usage

```
mean_center(x, group = NULL, weight = NULL)
```

Arguments

`x`	Input POINT or POLYGON simple features
`group`	name of character column specifying groups to calculate individual mean centers for
`weight`	name of numeric weight column specifying an individual point's contribution to the mean center

Value

An sf object with a mean center for each group

Examples

```
df <- data.frame(
  lon = c(20, 50, 30, 80, 10),
  lat = c(25, 70, 30, 50, 30),
  grp = c("a", "b", "a", "b", "a"),
  wt = c(1, 5, 1, 3, 2)
)
x <- sf::st_as_sf(df, coords = c("lon", "lat"), crs = 4326)
mean_center(x, group = "grp", weight = "wt")
```

median_center *Median Center*

Description

Median center iteratively calculates the point that minimizes distance to all features. One can specify the groups to calculate individual centers for and weights for each individual point. It is analagous to the ArcGIS Pro Median Center tool.

It uses the methodology introduced by Kuhn and Kuenne (1962).

Currently, median center is only implemenented for projected data.

Usage

```
median_center(x, group = NULL, weight = NULL, tolerance = 1e-04)
```

Arguments

x	Input POINT, MULTIPOINT, POLYGON, or MULTIPOLYGON simple features
group	name of character column specifying groups to calculate individual median centers for
weight	name of numeric weight column specifying an individual point's contribution to the median center
tolerance	numeric threshold determining when an estimate improvement is sufficiently small enough to stop iterating (smaller = slower, but more precision)

Value

An sf object with a median center for each group

Examples

```
df <- data.frame(
  lon = c(-88, -90, -92, -89, -90),
  lat = c(42, 40, 30, 32, 42),
  grp = c("a", "b", "a", "b", "a"),
  wt = c(1, 1, 1, 1, 1)
)
x <- sf::st_as_sf(df, coords = c("lon", "lat"), crs = 4326)
x_transformed <- sf::st_transform(x, crs = "ESRI:102003")
median_center(x_transformed, group = "grp", weight = "wt")
```

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