

Package ‘centr’

December 23, 2024

Title Weighted and Unweighted Spatial Centers

Version 0.2.1

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](https://doi.org/10.1111/j.1467-9787.1962.tb00902.x)>.

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Encoding UTF-8

RoxygenNote 7.3.2

Imports chk, dplyr, sf, tibble

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

Suggests knitr, rmarkdown, testthat (>= 3.0.0), tidycensus

Config/testthat/edition 3

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

VignetteBuilder knitr

NeedsCompilation no

Author Ryan Zomorrodi [aut, cre, cph]
(<<https://orcid.org/0009-0003-6417-5985>>)

Maintainer Ryan Zomorrodi <rzomor2@uic.edu>

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, weight, ...)
```

Arguments

<code>x</code>	Input POINT or POLYGON simple features
<code>group</code>	column name(s) specifying groups to calculate individual mean centers for
<code>weight</code>	name of numeric weight column specifying an individual point's contribution to the mean center
<code>...</code>	expressions passed to <code>dplyr::summarise()</code>

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")

x |>
  dplyr::group_by(grp) |>
  mean_center(weight = "wt")
```

median_center	<i>Median Center</i>
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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 analogous to the [ArcGIS Pro Median Center](#) tool.

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

Currently, median center is only implemented for projected data.

Usage

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

Arguments

x	Input POINT or POLYGON simple features
group	column name(s) specifying groups to calculate individual mean centers for
weight	name of numeric weight column specifying an individual point's contribution to the mean center
tolerance	numeric threshold determining when an estimate improvement is sufficiently small enough to stop iterating (smaller = slower, but more precision)
...	expressions passed to <code>dplyr::summarise()</code>

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")

x_transformed |>
  dplyr::group_by(grp) |>
  median_center(weight = "wt")
```

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