

Package ‘populR’

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Type Package

Title Population Down-Scaling

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Description Population down-scaling from a set of source zone geometrical features to another set of target zone geometries gem units using Areametric and Volumetric approaches. The aforementioned methods were adopted by Lwin K. K. and Murayama Y. work <[doi:10.1111/j.1467-9671.2009.01171.x](https://doi.org/10.1111/j.1467-9671.2009.01171.x)>.

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pp_a

Calculate Area/Volume for Target Zone Features

Description

Calculate Area/Volume for Target Zone Features

Usage

```
pp_a(target, volume = NULL)
```

Arguments

target	object of class sf
volume	(optional) target number of floors or height values of target features

Value

an object of class sf including area or volume values

Examples

```
library(populR)
data("target")
data("source")

# area calculation
pp_a(target = target)

# volume calculation
pp_a(target = target, volume = floors)
```

pp_calc

Population Calculation

Description

Population Calculation

Usage

```
pp_calc(target, a, D)
```

Arguments

target	object of class sf
a	area/volume field
D	density field

Value

an object of class sf including population values

Examples

```
library(populR)

data('source')
data('target')

# area calculation
pp_area <- pp_a(target = target)

# density calculation using area
pp_density_a <- pp_D(source = source, target = pp_area, sourcecode = sid,
  sourcepop = pop, area = pp_a)

# population calculation using area
pp_pop_area <- pp_calc(target = pp_density_a, a = pp_a, D = pp_D)

# volume calculation
pp_volume <- pp_a(target = target, volume = floors)

# density calculation using volume
pp_density_v <- pp_D(source = source, target = pp_volume, sourcecode = sid,
  sourcepop = pop, area = pp_a)

# population calculation using volume
pp_pop_volume <- pp_calc(target = pp_density_v, a = pp_a, D = pp_D)
```

pp_D

Calculate Population Density

Description

Calculate Population Density

Usage

```
pp_D(source, target, sourcecode, sourcepop, area, point = FALSE)
```

Arguments

source	object of class sf
target	object of class sf
sourcecode	source zone id field
sourcepop	source zone population field
area	target zone area field
point	logical - whether to use point geometries or not

Value

an object of class sf including density values for each source zone id

Examples

```
library(populR)

data('source')
data('target')

# area calculation
pp_area <- pp_a(target = target)

# density calculation using area
pp_density_a <- pp_D(source = source, target = pp_area, sourcecode = sid,
  sourcepop = pop, area = pp_a)

# volume calculation
pp_volume <- pp_a(target = target, volume = floors)

# density calculation using volume
pp_density_v <- pp_D(source = source, target = pp_volume, sourcecode = sid,
  sourcepop = pop, area = pp_a)
```

pp_estimate

Population Down-Scaling

Description

Population Down-Scaling

Usage

```
pp_estimate(
  source,
  target,
  sourcepop,
```

```

    sourcecode,
    volume = NULL,
    point = FALSE
  )

```

Arguments

source	object of class sf
target	object of class sf
sourcepop	source zone population field
sourcecode	source zone id field
volume	source zone number of floors or height field
point	logical - whether to use point geometries or not

Value

an object of class sf including population values

Examples

```

library(populR)

data('source')
data('target')

# using area
pp_estimate(source = source, target = target, sourcepop = pop,
            sourcecode = sid)

# using volume
pp_estimate(source = source, target = target, sourcepop = pop,
            sourcecode = sid, volume = floors)

# point geometries and area
pp_estimate(source = source, target = target, sourcepop = pop,
            sourcecode = sid, point = TRUE)

# point geometries and volume
pp_estimate(source = source, target = target, sourcepop = pop,
            sourcecode = sid, volume = floors, point = TRUE)

```

pp_rmse

RMS Error

Description

This function calculates the rmse between the source and target counts

Usage

```
pp_rmse(source, target, sourcecode, sourcepop, targetpop, title)
```

Arguments

source	object of class sf
target	object of class sf
sourcecode	source zone id field
sourcepop	source zone population field
targetpop	target zone population field
title	scatterplot title string

Value

a list including rms error, linear model details and correlation coefficient

Examples

```
library(populR)
data("target")
data("source")

# areametric
pop_aw <- pp_estimate(source = source, target = target, sourcepop = 'pop',
  sourcecode = 'sid')

# areametric rmse
pp_rmse(target = pop_aw, source = source, sourcecode = 'sid',
  sourcepop = 'pop', targetpop = 'pp_est', title = 'Areametric')

# volumetric
pop_vw <- pp_estimate(source = source, target = target, sourcepop = 'pop',
  sourcecode = 'sid', volume = 'floors')

# volumetric rmse
pp_rmse(target = pop_vw, source = source, sourcecode = 'sid',
  sourcepop = 'pop', targetpop = 'pp_est', title = 'Volumetric')
```

 pp_round

Rounding Function

Description

This function converts decimal population estimates produced by the [pp_estimate](#) approach into integer numbers that sum up to the source zone population counts

Usage

```
pp_round(target, targetpop, sourcepop, sourcecode)
```

Arguments

target	object of class sf
targetpop	string of target estimated pop column
sourcepop	string of source pop column
sourcecode	string of source id column

Value

an object of class sf including rounded population counts

Examples

```
library(popu1R)

data("target")
data("source")

# areametric
pop_aw <- pp_estimate(source = source, target = target,
  sourcepop = pop, sourcecode = sid)

# areametric round
round_aw <- pp_round(target = pop_aw, targetpop = pp_est,
  sourcepop = pop, sourcecode = sid)

# volumetric
pop_vw <- pp_estimate(source = source, target = target,
  sourcepop = pop, sourcecode = sid, volume = floors)

# volumetric round
round_vw <- pp_round(target = pop_vw, targetpop = pp_est,
  sourcepop = "pop", sourcecode = sid)
```

source

Source

Description

object of sf class representing the blocks of a fictional area

Usage

```
source
```

Format

object of sf class with 6 rows and 3 columns:

id source id
pop population count
geometry geometry

Source

<http://www.mbatsaris.gr/>

target	<i>Target</i>
--------	---------------

Description

object of sf class representing the buildings of a fictional areag

Usage

target

Format

object of sf class with 19 rows and 2 columns:

floors number of floors
geometry geometry

Source

<http://mbatsaris.gr/>

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