Package ‘fca’

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Title Floating Catchment Area (FCA) Methods to Calculate Spatial Accessibility

Version 0.1.0

Description Perform various floating catchment area methods to calculate a spatial accessibility index (SPAI) for demand point data. The distance matrix used for weighting is normalized in a preprocessing step using common functions (gaussian, gravity, exponential or logistic).

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BugReports https://github.com/egrueebler/fca/issues/

Encoding UTF-8

RoxygenNote 7.1.2

Suggests covr, knitr, rmarkdown, testthat

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

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### dist_normalize

**Distance weight methods**

**Description**

Distance weight methods

**Usage**

```r
dist_normalize(D, d_max, imp_function, function_d_max = 0.01)
```

**Arguments**

- **D**: numeric matrix, distance or time values
- **d_max**: numeric, threshold for max distance
- **imp_function**: character, type of distance weights method
- **function_d_max**: numeric, condition for the result of the function(d_max) used to calculate beta (default = 0.01, is considered optimal for the Gaussian function)

**Value**

matrix, normalized distance or time values

**Examples**

```r
dist_normalize(matrix(10), 10, "gaussian")
```

### spai_2sfca

**Two-Step Floating Catchment Area method**

**Description**

Two-Step Floating Catchment Area method

**Usage**

```r
spai_2sfca(p, s, W, step = 2)
```

**Arguments**

- **p**: numeric vector, number of population at origin locations
- **s**: numeric vector, capacity of services at supply locations
- **W**: numeric matrix, distance or time matrix
- **step**: numeric, number of the steps of the method to perform
spai_3sfca

Value
data.frame, depending on selected step

Examples

p <- 1:4
s <- 1:6
W <- matrix(1:24, ncol = 4, nrow = 6)
spai <- spai_2sfca(p, s, W, step = 2)

spai_3sfca  Three-Step Floating Catchment Area method

Description
Three-Step Floating Catchment Area method

Usage

spai_3sfca(p, s, W, step = 3)

Arguments

p  numeric vector, number of population at origin locations
s  numeric vector, capacity of services at supply locations
W  numeric matrix, distance or time matrix
step  numeric, number of the steps of the method to perform

Value
data.frame, depending on selected step

Examples

p <- 1:4
s <- 1:6
W <- matrix(1:24, ncol = 4, nrow = 6)
spai <- spai_3sfca(p, s, W, step = 3)
Modified-Huff-Three-Step Floating Catchment Area method

Usage

spai_mh3sfca(p, s, W, step = 3)

Arguments

- **p**: numeric vector, number of population at origin locations
- **s**: numeric vector, capacity of services at supply locations
- **W**: numeric matrix, distance or time matrix
- **step**: numeric, number of the steps of the method to perform

Value
data.frame, depending on selected step

Examples

```r
p <- 1:4
s <- 1:6
W <- matrix(1:24, ncol = 4, nrow = 6)
spai <- spai_mh3sfca(p, s, W, step = 3)
```
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