Package ‘sabre’

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Title Spatial Association Between Regionalizations


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Encoding UTF-8

LazyData true

ByteCompile true

Suggests testthat, covr, knitr, rmarkdown, methods

RoxygenNote 7.2.1

Depends R (>= 3.3.0)

Imports dplyr, entropy, raster, rlang, sf, tibble, tidyr

Enhances stars, terra

VignetteBuilder knitr

URL https://jakubnowosad.com/sabre/

BugReports https://github.com/Nowosad/sabre/issues

NeedsCompilation no

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```
eco_us    Ecoregions of the United States

Description

  Bailey's Ecoregions of the Conterminous United States

Usage

  eco_us

Format

  An object of class `sf` (inherits from `data.frame`) with 330 rows and 5 columns.

Source

  https://www.sciencebase.gov/catalog/item/54244abde4b037b608f9e23d

```

```
mapcurves    Mapcurves

Description

  Mapcurves: a quantitative method for comparing categorical maps.

Usage

  mapcurves(x, y, z = NULL)
```
Arguments

- **x**: A numeric vector, representing a categorical values.
- **y**: A numeric vector, representing a categorical values.
- **z**: A numeric matrix. The goodness of fit (GOF) value for each pair of classes in x and y. By default this argument is set to NULL, and the value of z is calculated based on x and y.

Value

A list with two elements:

- "ref_map" - the map to be used as reference ("x" or "y")
- "gof" - the Mapcurves's goodness of fit value

References


Examples

```r
set.seed(2018-03-21)
A = floor(matrix(runif(100, 0, 9), 10))
B = floor(matrix(runif(100, 0, 9), 10))
mapcurves(A, B)
```

Description

It calculates the Mapcurves’s goodness-of-fit (GOF)

Usage

```r
mapcurves_calc(x, y, x_name, y_name, precision = NULL)
```

"S3 method for class 'sf'

```r
mapcurves_calc(x, y, x_name = NULL, y_name = NULL, precision = NULL)
```

"S3 method for class 'stars'

```r
mapcurves_calc(x, y, x_name = NULL, y_name = NULL, precision = NULL)
```

"S3 method for class 'SpatRaster'

```r
mapcurves_calc(x, y, x_name = NULL, y_name = NULL, precision = NULL)
```

"S3 method for class 'RasterLayer'

```r
mapcurves_calc(x, y, x_name = NULL, y_name = NULL, precision = NULL)
```
Arguments

- **x**: An object of class `sf` with a `POLYGON` or `MULTIPOLYGON` geometry type or a spatial raster object of class `RasterLayer`, `SpatRaster`, or `stars`.
- **y**: An object of class `sf` with a `POLYGON` or `MULTIPOLYGON` geometry type or a spatial raster object of class `RasterLayer`, `SpatRaster`, or `stars`.
- **x_name**: A name of the column with regions/clusters names.
- **y_name**: A name of the column with regions/clusters names.
- **precision**: numeric, or object of class `units` with distance units (but see details); see `st_as_binary` for how to do this.

Value

A list with four elements:

- "map1" - the sf object containing the first map used for calculation of GOF
- "map2" - the sf object containing the second map used for calculation of GOF
- "ref_map" - the map used as a reference ("x" or "y")
- "gof" - the Mapcurves’s goodness of fit value

References


Examples

```r
library(sf)
data("regions1")
data("regions2")

mc = mapcurves_calc(x = regions1, y = regions2, x_name = z, y_name = z)
mc

plot(mc$map1)
plot(mc$map2)

library(raster)
data("partitions1")
data("partitions2")
mc2 = mapcurves_calc(x = partitions1, y = partitions2)
mc2

plot(mc2$map1)
plot(mc2$map2)
```
**partitions1**

*Red regionalization (raster version)*

**Description**

Raster data of the red regionalization used in Figure 1 of Stepinski and Nowosad (2018)

**Usage**

`partitions1`

**Format**

An object of class `RasterLayer` of dimension 8 x 10 x 1.

**References**


---

**partitions2**

*Blue regionalization (raster version)*

**Description**

Raster data of the blue regionalization used in Figure 1 of Stepinski and Nowosad (2018)

**Usage**

`partitions2`

**Format**

An object of class `RasterLayer` of dimension 8 x 10 x 1.

**References**

**regions1**  
*Red regionalization*

**Description**
Data of the red regionalization used in Figure 1 of Stepinski and Nowosad (2018)

**Usage**
`regions1`

**Format**
An object of class `sf` (inherits from `data.frame`) with 4 rows and 2 columns.

**References**

---

**regions2**  
*Blue regionalization*

**Description**
Data of the blue regionalization used in Figure 1 of Stepinski and Nowosad (2018)

**Usage**
`regions2`

**Format**
An object of class `sf` (inherits from `data.frame`) with 3 rows and 2 columns.

**References**
vmeasure

<table>
<thead>
<tr>
<th>vmeasure</th>
<th>V-measure</th>
</tr>
</thead>
</table>

Description

A conditional entropy-based external cluster evaluation measure.

Usage

vmeasure(x, y, z = NULL, B = 1)

Arguments

- **x**: A numeric vector, representing a categorical values.
- **y**: A numeric vector, representing a categorical values.
- **z**: A numeric matrix. A contingency table of the counts at each combination of categorical levels. By default this argument is set to NULL, and the value of \( z \) is calculated based on \( x \) and \( y \).
- **B**: A numeric value. If \( B > 1 \) then completeness is weighted more strongly than homogeneity, and if \( B < 1 \) then homogeneity is weighted more strongly than completeness. By default this value is 1.

Value

A list with three elements:

- "v_measure"
- "homogeneity"
- "completeness"

References


Examples

```r
x = c(1, 1, 1, 2, 2, 3, 3, 3, 1, 1, 2, 2, 2, 3, 3)
y = c(rep(1, 5), rep(2, 5), rep(3, 5))
vmeasure(x, y)
```
**vmeasure_calc**  

**V-measure calculation**

---

**Description**

It calculates a degree of spatial association between regionalizations using an information-theoretical measure called the V-measure.

**Usage**

```r
vmeasure_calc(x, y, x_name, y_name, B = 1, precision = NULL)
```

### S3 method for class 'sf'

```r
vmeasure_calc(x, y, x_name, y_name, B = 1, precision = NULL)
```

### S3 method for class 'stars'

```r
vmeasure_calc(x, y, x_name = NULL, y_name = NULL, B = 1, precision = NULL)
```

### S3 method for class 'SpatRaster'

```r
vmeasure_calc(x, y, x_name = NULL, y_name = NULL, B = 1, precision = NULL)
```

### S3 method for class 'RasterLayer'

```r
vmeasure_calc(x, y, x_name = NULL, y_name = NULL, B = 1, precision = NULL)
```

**Arguments**

- **x**
  - An object of class sf with a POLYGON or MULTIPOLYGON geometry type or a spatial raster object of class RasterLayer, SpatRaster, or stars.

- **y**
  - An object of class sf with a POLYGON or MULTIPOLYGON geometry type or a spatial raster object of class RasterLayer, SpatRaster, or stars.

- **x_name**
  - A name of the column with regions/clusters names.

- **y_name**
  - A name of the column with regions/clusters names.

- **B**
  - A numeric value. If $B > 1$ then completeness is weighted more strongly than homogeneity, and if $B < 1$ then homogeneity is weighted more strongly than completeness. By default this value is 1.

- **precision**
  - numeric, or object of class units with distance units (but see details); see `st_as_binary` for how to do this.

**Value**

A list with five elements:

- "map1" - the sf object containing the first preprocessed map used for calculation of GOF with two attributes - `map1` (name of the category) and `rih` (region inhomogeneity).
- "map2" - the sf object containing the second preprocessed map used for calculation of GOF with two attributes - `map1` (name of the category) and `rih` (region inhomogeneity).
• "v_measure"
• "homogeneity"
• "completeness"

References


Examples

```r
library(sf)
data("regions1")
data("regions2")
vm = vmeasure_calc(x = regions1, y = regions2, x_name = z, y_name = z)
vm

plot(vm$map1["rih"])
plot(vm$map2["rih"])

library(raster)
data("partitions1")
data("partitions2")
vm2 = vmeasure_calc(x = partitions1, y = partitions2)
vm2

plot(vm2$map1["rih"]) plot(vm2$map2["rih"])```

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