Package 'sc2sc'

April 20, 2025

Type Package

Title Spatial Transfer of Statistics among Spanish Census Sections

Version 0.0.1-17

Description Transfers/imputes statistics among Spanish spatial polygons (census sections or postal code areas) from different moments in time (2001-2023) without need of spatial files, just linking statistics to the ID codes of the spatial units.
The data available in the census sections of a partition/division (cartography) into force in a moment of time is transferred to the census sections of another partition/division employing the geometric approach (also known as areal weighting or polygon overlay).
References:
Goerlich (2022) <doi:10.12842/WPIVIE_0322>.
Pavía and Cantarino (2017a, b) <doi:10.1111/gean.12112>, <doi:10.1016/j.apgeog.2017.06.021>.
Pérez and Pavía (2024a, b) <doi:10.4995/CARMA2024.2024.17796>, <doi:10.38191/iirr-jorr.24.057>.
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License GPL (>= 2)

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Imports stats

RoxygenNote 7.2.3

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Contents

`cp2sc` *Implements the geometric spatial transfer of statistics from Spanish postal code areas to census sections*

Description

Transfers the statistics available in a set of Spanish postal codes to the corresponding spatial set of Spanish official census sections into force in a given year.

Usage

```
cp2sc(x, year, data.type = "counts", all.units = FALSE, na.rm = TRUE, ...)
```

Arguments

`x`	A data frame of order N x K (with K > 1) with the statistics to be spatially transferred/imputed. The first column must contains the codes of the postal code areas to which the statistics belong to. The statistical nature of the data columns must be of the same type. See the argument `data.type`.
`year`	An integer number. Reference year of the census sections to which the statistics are going to be transferred. Only 2001 and 2003 to 2023 are allowed.
`data.type`	A character string indicating the type of data to be transferred, either `"counts"` (aggregate statistics) or `"averages"` (mean, proportion or rate statistics). Default `"counts"`.
`all.units`	A `TRUE/FALSE` value indicating the census section units of the destination division to be included in the output data frame. If `TRUE` all the units of the destination division are included. If `FALSE` only those units for which a value is imputed are included. Default, `FALSE`.
`na.rm`	A `TRUE/FALSE` logical value indicating whether `NA` values should be stripped before the computations proceed. Default, `TRUE`.
`...`	Other arguments to be passed to the function. Not currently used.

Value

A list with the following components

`df`	A data frame with the statistics spatially transferred to the census sections corresponding to the `year.sscc.dest` division.
`missing`	A vector with the codes of the postal code areas included in `x` that are not available in the shp file of postal code area division.

Note

The data that allows to transfer statistics among census sections and/or postal code areas has been own elaboration by the authors using (i) the Spanish Digital Cartography Files available in http://www.ine.es that contain the digitalisation of the georeferenced polygons of the census sections, according to UTM coordinates 28, 29, 30 and 31, and (ii) the Cartography File of postal code areas developed by Goerlich (2022).

Neither The Spanish Statistical Office (Instituto Nacional de Estadística) nor Professor Goerlich had any involvement in preparing this package. They bear no responsibility on the results derived from using this package.

Postal code areas have 2019 as reference year. It must be noted, however, that they can be considered as almost time stationary. Spanish postal code areas are quite stable over time.

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References

Goerlich, FJ (2022). Elaboracion de un mapa de codigos postales de Espana con recursos libres. Como evitar pagar a Correos 6000 euros por informacion de referencia. Working Papers Ivie n. 2022-3. Valencia: Ivie. doi:10.12842/WPIVIE_0322

Pavia, JM and Cantarino, I (2017a). Can dasymetric mapping significantly improve population data reallocation in a dense urban area? *Geographical Analysis*, 49(2), 155-174. doi:10.1111/gean.12112

Pavia, JM and Cantarino, I (2017b). Dasymetric distribution of votes in a dense city. *Applied Geography*, 86, 22-31. doi:10.1016/j.apgeog.2017.06.021

Perez, V and Pavia, JM (2024a). Improving Accuracy in Geospatial Information Transfer: A Population Density-Based Approach, in *6th International Conference on Advanced Research Methods and Analytics (CARMA 2024)*, Editorial Universitat Politecnica de Valencia, pp. 326-333. doi:10.4995/CARMA2024.2024.17796

Perez, V and Pavia, JM (2024b) Automating the transfer of data between census sections and postal codes areas over time. An application to Spain. *Investigaciones Regionales - Journal of Regional Research*, forthcoming. doi:10.38191/iirrjorr.24.057

See Also

sc2cp sc2sc

Examples

```
data <- structure(list(CCPP = c(1120L, 1160L, 1250L, 1212L, 1213L),
                       income = c(15000L, 12000L, 11500L,
                       13000L, 12500L)),
                  class = "data.frame", row.names = c(NA, -5L))
example <- cp2sc(x = data, year = 2014, data.type = "averages")
```

sc2cp *Implements the geometric spatial transfer of statistics from Spanish census sections to postal code areas*

Description

Transfers the statistics available in a set of Spanish census sections from a given year to the corresponding spatial set of Spanish official postal code areas.

Usage

```
sc2cp(x, year, data.type = "counts", all.units = FALSE, na.rm = TRUE, ...)
```

Arguments

x	A data frame of order N x K (with K > 1) with the statistics to be spatially transferred/imputed. The first column must contains the code of the census section to which the statistics belong to. The statistical nature of the data columns must be of the same type. See the argument data.type.
year	An integer number. Reference year of the census sections included in the first column of x. Only 2001 and 2003 to 2023 are allowed.
data.type	A character string indicating the type of data to be transferred, either "counts" (aggregate statistics) or "averages" (mean, proportion or rate statistics). Default "counts".
all.units	A TRUE/FALSE logical value indicating the postal code area division to be included in the output data frame. If TRUE all the postal code areas are included. If FALSE only those units for which a value is imputed are included. Default, FALSE.
na.rm	A TRUE/FALSE logical value indicating whether NA values should be stripped before the computations proceed. Default, TRUE.
...	Other arguments to be passed to the function. Not currently used.

Value

A list with the following components

df	A data frame with the statistics spatially transferred to the postal code areas.
missing	A vector with the codes of the census sections included in x that are not available in the shp file of census sections corresponding to the year.sscc.origin division.

Note

The data that allows to transfer statistics among census sections and/or postal code areas has been own elaboration by the authors using (i) the Spanish Digital Cartography Files available in http://www.ine.es that contain the digitalisation of the georeferenced polygons of the census sections, according to UTM coordinates 28, 29, 30 and 31, and (ii) the Cartography File of postal code areas developed by Goerlich (2022).

Neither The Spanish Statistical Office (Instituto Nacional de Estadística) nor Professor Goerlich had any involvement in preparing this package. They bear no responsibility on the results derived from using this package.

Postal code areas have 2019 as reference year. It must be noted, however, that they can be considered as almost time stationary. Spanish postal code areas are quite stable over time.

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References

Goerlich, FJ (2022). Elaboracion de un mapa de codigos postales de Espana con recursos libres. Como evitar pagar a Correos 6000 euros por informacion de referencia. Working Papers Ivie n. 2022-3. Valencia: Ivie. doi:10.12842/WPIVIE_0322

Pavia, JM and Cantarino, I (2017a). Can dasymetric mapping significantly improve population data reallocation in a dense urban area? *Geographical Analysis*, 49(2), 155-174. doi:10.1111/gean.12112

Pavia, JM and Cantarino, I (2017b). Dasymetric distribution of votes in a dense city. *Applied Geography*, 86, 22-31. doi:10.1016/j.apgeog.2017.06.021

Perez, V and Pavia, JM (2024a). Improving Accuracy in Geospatial Information Transfer: A Population Density-Based Approach, in *6th International Conference on Advanced Research Methods and Analytics (CARMA 2024)*, Editorial Universitat Politecnica de Valencia, pp. 326-333. doi:10.4995/CARMA2024.2024.17796

Perez, V and Pavia, JM (2024b) Automating the transfer of data between census sections and postal codes areas over time. An application to Spain. *Investigaciones Regionales - Journal of Regional Research*, forthcoming. doi:10.38191/iirrjorr.24.057

See Also

sc2cp cp2sc

Examples

```
data <- structure(list(SSCC = c(0103701001, 4619401008, 4603103003),
                       pop = c(12000L, 14000L, 11000L)),
                       class = "data.frame", row.names = c(NA, -3L))
example <- sc2cp(x = data, year = 2012, data.type = "counts")
```

sc2sc *Implements the geometric spatial transfer of statistics among Spanish census sections corresponding to two different spatial divisions*

Description

Spatially transfers the statistics available in a set of Spanish census sections corresponding to the division into force in a given year to the census sections of another division with reference in another year.

Usage

```
sc2sc(
  x,
  year.sscc.origin,
  year.sscc.dest,
  data.type = "counts",
  all.units = FALSE,
  na.rm = TRUE,
  ...
)
```

Arguments

x	A data frame of order N x K (with K > 1) with the statistics to be spatially transferred/imputed. The first column must contains the codes of the census sections to which the statistics belong to. The statistical nature of the data columns must be of the same type. See the argument data.type.
year.sscc.origin	An integer number. Reference year of the census sections included in the first column of x. Only 2001 and 2003 to 2023 are allowed.
year.sscc.dest	An integer number. Reference year of the census sections to which the statistics are going to be transferred. Only 2001 and 2003 to 2023 are allowed and it must be different than year.sscc.origin.
data.type	A character string indicating the type of data to be transferred, either "counts" (aggregate statistics) or "averages" (mean, proportion or rate statistics). Default "counts".
all.units	A TRUE/FALSE logical value indicating the census section units of the destination division to be included in the output data frame. If TRUE all the units of the destination division are included. If FALSE only those units for which a value is imputed are included. Default, FALSE.
na.rm	A TRUE/FALSE logical value indicating whether NA values should be stripped before the computations proceed. Default, TRUE.
...	Other arguments to be passed to the function. Not currently used.

Value

A list with the following components

`df`	A data frame with the statistics spatially transferred to the census sections corresponding to the `year.sscc.dest` division.
`missing`	A vector with the codes of the census sections included in `x` that are not available in the shp file of census sections corresponding to the `year.sscc.origin` division.

Note

The data that allows to transfer throughout time statistics among census sections has been own elaboration by the authors using the Spanish Digital Cartography Files in http://www.ine.es that contain the digitalisation of the georeferenced polygons of the census sections, according to UTM coordinates 28, 29, 30 and 31.

The Spanish Statistical Office (Instituto Nacional de Estadistica) had any involvement in preparing this package. They bear no responsibility on the results derived from using this package.

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References

Pavia, JM and Cantarino, I (2017a). Can dasymetric mapping significantly improve population data reallocation in a dense urban area? *Geographical Analysis*, 49(2), 155-174. doi:10.1111/gean.12112

Pavia, JM and Cantarino, I (2017b). Dasymetric distribution of votes in a dense city. *Applied Geography*, 86, 22-31. doi:10.1016/j.apgeog.2017.06.021

Perez, V and Pavia, JM (2024b) Automating the transfer of data between census sections and postal codes areas over time. An application to Spain. *Investigaciones Regionales - Journal of Regional Research*, forthcoming. doi:10.38191/iirrjorr.24.057

See Also

`sc2cp` `cp2sc`

Examples

```
data <- structure(list(SSCC = c(3403601001, 3403701001, 3403801001, 3403901001,
                                3404101001, 3404201001, 3404501001, 3404601001,
                                3404701001, 3404701002, 3404801001),
                       X15.19 = c(4L, 7L, 13L, 0L, 0L, 13L, 1L, 5L, 30L, 48L, 1L),
                       X20.24 = c(5L, 5L, 9L, 0L, 2L, 12L, 2L, 1L, 34L, 61L, 3L)),
                       row.names = 1:11, class = "data.frame")
example <- sc2sc(x = data, year.sscc.origin = 2020, year.sscc.dest = 2019)
```

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