Package: saePseudo (via r-universe)

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Type Package

Title Small Area Estimation using Averaging Pseudo Area Level Model

Version 0.1.0

Maintainer Darin Huwaida <darinhuwaida21@gmail.com>

Description Provides function for small area estimation at area level using averaging pseudo area level model for variables of interest. A dataset produced by data generation is also provided. This package estimates small areas at the village level and then aggregates them to the sub-district, region, and provincial levels.

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URL https://github.com/darinhuwaidaa/saePseudo

BugReports https://github.com/darinhuwaidaa/saePseudo/issues

Depends R (>= 3.5.0)

Imports dplyr, sae

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Encoding UTF-8

LazyData true

RoxygenNote 7.2.3

Config/testthat/edition 3

Repository https://darinhuwaidaa.r-universe.dev

RemoteUrl https://github.com/darinhuwaidaa/saepseudo

RemoteRef HEAD

RemoteSha f2a524a65622549f730939c8474361c3d09a828b

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avgPseudo *Small Area Estimation using Averaging Pseudo Area Level Model*

Description

Provides function for small area estimation at area level using averaging pseudo area level model for variables of interest. A dataset produced by data generation are also provided. This package estimates small areas at the village level and then aggregates them to the sub-district, region, and provincial levels.

Usage

```
avgPseudo(prov, reg, sub, vill, y, x, var, N, method = "REML")
```

Arguments

`prov`	Vector containing information of province
`reg`	Vector containing information of region
`sub`	Vector containing information of subdistrict
`vill`	Vector containing information of village
`y`	Direct estimation for each area
`x`	Auxiliary variable for each area
`var`	Sampling variances of direct estimators for each domain
`N`	Number of population in each area
`method`	Method used to fit the Fay-Herriot model, which can be either "ML", "REML" or "FH" methods. Default is "REML" method

Value

This function returns a list of the following objects:

`Est_Area3`	A dataframe with the values of Small Area Estimation with averaging pseudo area level model for sub-district level
`Est_Area2`	A dataframe with the values of Small Area Estimation with averaging pseudo area level model for region level
`Est_Area1`	A dataframe with the values of Small Area Estimation with averaging pseudo area level model for provincial level

Examples

```
# Load Dataset
data(dataVill)
saeAVG.Pseudo <- avgPseudo(prov = dataVill$Area1, reg = dataVill$Area2, sub = dataVill$Area3,
                 vill = dataVill$Area4, y = dataVill$ydir_area4, x = dataVill$X1,
                 var = dataVill$vardir_area4, N = dataVill$N, method="REML")

# Result
saeAVG.Pseudo$Est_Area3
saeAVG.Pseudo$Est_Area2
saeAVG.Pseudo$Est_Area1
```

`dataVill` *Sample Data for Small Area Estimation using Averaging Pseudo Area Level Model*

Description

Dataset to simulate Small Area Estimation using Averaging Pseudo Area Level Model This data is generated by these following steps:

1. Generate population data consisting Area1 (province), Area2 (region), Area3 (sub-district), Area4 (village), and Unit. The auxiliary variabels are generated by Uniform distribution with $(x1\ U(40, 100))$ and Normal distribution with $(x2\ N(70, 5))$. The coefficient parameters are set as $\beta_0 = 0.5$, $\beta_1 = 0.2$, and $\beta_2 = 0.2$
2. Calculate $y_k = \beta_0 + \beta_1 * x1_k + \beta_2 * x_2k$
3. Generate number of sample with simple random sampling with replacement
4. Calculate $ydir_area4 = \frac{\Sigma y_k}{n}$, $vardir_area4 = \frac{\Sigma(y_k - \frac{\Sigma y_k}{n})^2}{n-1}$, and auxiliary variable $X1 = \frac{\Sigma x1_k}{n}$
5. Calculate N (number of population) based on the initial population generated for each Area4 selected as a sample
6. Area1, Area2, Area3, Area4, ydir_area4, vardir_area4, X1, and N are combined in a dataframe called dataVill.

Usage

```
dataVill
```

Format

A data frame with 83 observations on the following 8 variables:

Area1 Province

Area2 Region

Area3 Sub-district

Area4 Village

ydir_area4 Direct Estimation of y

vardir_area4 Sampling variance of y

X1 Auxiliary variable

N Number of population in area4

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