Package 'saekernel'

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Type Package

Title Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel

Version 0.1.1

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Description Propose an area-level, non-parametric regression estimator based on Nadaraya-Watson kernel on small area mean. Adopt a two-stage estimation approach proposed by Prasad and Rao (1990). Mean Squared Error (MSE) estimators are not readily available, so resampling method that called bootstrap is applied. This package are based on the model proposed in Two stage non-parametric approach for small area estimation by Pushpal Mukhopadhyay and Tapabrata Maiti(2004) <http://www.asasrms.org/Proceedings/y2004/files/Jsm2004-000737.pdf>.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.0.2

URL https://github.com/wicaksh/saekernel

BugReports https://github.com/wicaksh/saekernel/issues

Suggests knitr, rmarkdown, covr

VignetteBuilder knitr

Imports stats

Depends R (>= 2.10)

NeedsCompilation no

Repository CRAN

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R topics documented:

`Data_saekernel` *Sample Data for Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel*

Description

Dataset to Simulate Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel

This data is generated by these following steps:

1. Generate explanatory variables `Vardir`. `Vardir ~ abs(N(0, 0.1))`
   Generate explanatory variables `x`. `x ~ U(min=0, max=1)`
   Calculate direct estimation `y` where $y_i = sin(2 * \pi * x^3) + 5$
2. Then combine the direct estimations `y`, auxiliary variables `x`, and sampling varians `Vardir` in a dataframe then named as Data_saekernel

Usage

```
Data_saekernel
```

Format

A data frame with 100 rows and 3 variables:

y Direct Estimation of Y

x Auxiliary Variable of X

Vardir Sampling Variance of Y

`mse_saekernel` *Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel and Bootstrap Mean Squared Error Estimators*

Description

This Function Gives Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel and Calculates The Bootstrap Mean Squared Error Estimates

Usage

```
mse_saekernel(X, Y, vardir, bandwidth, B = 1000)
```

Arguments

X	Auxiliary Variable of X
Y	Direct Estimation of Y
vardir	Sampling Variances of Direct Estimators
bandwidth	The kernel Bandwidth Smoothing Parameter
B	Number of Bootstrap. Default is 1000

Value

This function returns a list with following objects:

est	a value of Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel
refvar	Estimated Random Effect Variance
mse	Bootstrap Mean Squared Error Estimators of Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel

Examples

```
##load dataset
data(Data_saekernel)

mse_saekernel(X = Data_saekernel$x, Y = Data_saekernel$y,
vardir = Data_saekernel$Vardir, bandwidth = 0.04, B = 1000)
```

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saekernel *Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel*

Description

This Function Gives Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel

Usage

```
saekernel(X, Y, vardir, bandwidth)
```

Arguments

X	Auxiliary Variable of X
Y	Direct Estimation of Y
vardir	Sampling variances of Direct Estimators
bandwidth	The kernel Bandwidth Smoothing Parameter

Value

This function returns a list with following objects:

`est`	a value of Small Area Estimation Non-Parametric Based Nadaraya-Watson Kernel
`refvar`	Estimated Random Effect Variance

Examples

```
##load dataset
data(Data_saekernel)

saekernel(X = Data_saekernel$x, Y = Data_saekernel$y,
vardir = Data_saekernel$Vardir, bandwidth = 0.04)
```

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