Package 'cudia'

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Type Package

Title CUDIA Cross-level Imputation

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Suggests MASS

Description Reconstruct individual-level values from aggregate-level summaries.

License GPL-2

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R topics documented:

cudia-package *CUDIA Cross-level Imputation*

Description

Reconstruct individual-level values from aggregate-level summaries.

Details

Package:	cudia
Type:	Package
Version:	0.1
Date:	2012-08-17
License:	GPL-2

model <- cudia(formular,data,K)

Author(s)

Yubin Park and Joydeep Ghosh, Maintainer: Yubin Park <yubin.park@utexas.edu>

References

Y. Park and J. Ghosh, *CUDIA: Probabilistic Cross-level Imputation using Individual Auxiliary Information*, ACM Trans-IST, 2012.

Examples

```
data(cudia_simul,package="cudia")
mod <- cudia(aggr~indiv,cudia_simul,K=3)
summary(mod)
```

cudia *CUDIA: cross-level imputation framework*

Description

Estimate the CUDIA model parameters, then output cross-level imputed values. The default algorithm is set to the Bregman deterministic clustering algorithm in the referenced paper. Currently, only Gaussian-type data are supported.

Usage

```
cudia(formula, data, K, ...)
```

Arguments

formula	a symbolic description of the model to be fit. e.g. x~y+z means that the aggregate-level summary x is cross-level imputed using individual-level data y and z.
data	a data frame object in the model.
K	a number of intrinsic clusters.
...	other algorithm operational parameters

Value

An object of class cudia, basically a list including elements

indiv	original individual-level data
fitted.values	cross-level imputed aggregated data
theta	parameter vectors for individual-level clusters
eta	a parameter vector for aggregate-level clusters
Nk	estimated cluster sizes
xlab	variable names of individual-level data

Author(s)

Yubin Park

References

Y. Park and J. Ghosh, *CUDIA: Probabilistic Cross-level Imputation using Individual Auxiliary Information*, ACM Trans-IST, 2012.

See Also

print, plot methods

Examples

```
data(cudia_simul,package="cudia")
mod.sim <- cudia(aggr~indiv,cudia_simul,K=3)
summary(mod.sim)
```

cudia_medic — *Artificial medicare state-level spendings with individual demographic features*

Description

The `cudia_medic` data frame as 5 columns: 4 individual-level and 1 aggregate-level medicare spendings.

Usage

```
cudia_medic
```

Format

This data frame contains the following columns:

income individual-level income data

house_value value of each individual's house

age age of each individual

se_index socio-economic index of each individual

medicare_d state-level medicare summary (durable goods)

Source

J. Ghosh and Y. Park, *Integrated Predictive Modeling of Variable-Resolution Healthcare Data*, Meaningful Use of Complex Medical Data 2012.

cudia_simul — *Simulatation data with individual- and aggregate-level columns*

Description

The `cudia_simul` data frame as 2 columns, individual-level and aggregate-level artificial data. The data is formed from three distinct clusters.

Usage

```
cudia_simul
```

Format

This data frame contains the following columns:

indiv individual-level data

aggr aggregate-level data from 10 random partitions

Source

Y. Park and J. Ghosh, *CUDIA: Probabilistic Cross-level Imputation using Individual Auxiliary Information*, ACM Trans-IST, 2012.

Examples

```
data(cudia_simul,package="cudia")
mod.sim <- cudia(aggr~indiv,cudia_simul,K=3)
summary(mod.sim)
```

`plot.cudia` *plot cross-level imputed values with individual-level data.*

Description

Plot cross-level imputed (fitted) values with respect to individual-level data. The original aggregate-level values are not plotted.

Usage

```
## S3 method for class 'cudia'
plot(x, ...)
```

Arguments

`x`	cudia object
`...`	Other graphical parameters to plot

Author(s)

Yubin Park

See Also

`cudia` method

Examples

```
data(cudia_simul,package="cudia")
mod.sim <- cudia(aggr~indiv,cudia_simul,K=3)
plot(mod.sim)
```

`print.cudia` *print a cudia object*

Description

Print a summary of the estimated parameters of the CUDIA model.

Usage

```
## S3 method for class 'cudia'
print(x, ...)
```

Arguments

`x`	fitted cudia object
`...`	additional print arguements

Details

Two main parameters of CUDIA are printed: theta and eta. Theta is a parameter matrix of individual-level data, and eta is a parameter vector of aggregate-level data.

Author(s)

Yubin Park

See Also

`cudia` method.

Examples

```
data(cudia_simul,package="cudia")
mod <- cudia(aggr~indiv,cudia_simul,K=3)
print(mod)
```

summary.cudia *summary of CUDIA*

Description

summary of CUDIA

Usage

```
## S3 method for class 'cudia'
summary(object, ...)
```

Arguments

object	cudia object
...	other summary parameters

Author(s)

Yubin Park

Examples

```
data(cudia_simul,package="cudia")
mod <- cudia(aggr~indiv,cudia_simul,K=3)
summary(mod)
```

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