Package 'fglsnet'

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Type Package

Title A Feasible Generalized Least Squares Estimator for Regression Analysis of Outcomes with Network Dependence

Version 1.1

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Description
The function estimates a multivariate regression model for outcomes with network dependence.

Imports network, sna, matrixcalc, Matrix, MASS, sandwich, lmtest

License GPL-3

LazyData true

Encoding UTF-8

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NeedsCompilation no

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dat *Simulated data for demonstrating* "fglsnet".

Description

Simulated data for demonstrating "fglsnet".

Usage

```
data(dat)
```

Format

An object of class list of length 3.

Details

Y is the outcome. X contains the regressors including the intercept.. M is the dependence network.

fglsnet *A Feasible Generalized Least Squares Estimator for Regression Analysis of Outcomes with Network Dependence*

Description

fglsnet estimates a multivariate regression model for analyzing outcomes with network dependence. One nice feature of the function is that it can distinguish three types of error dependence, including triadic dependence, mutual dependence, and asymmetric dependence.

Usage

```
fglsnet(
  formula,
  M = NULL,
  directed = TRUE,
  mcorr = TRUE,
  CSE = FALSE,
  k = 10,
  data = data
)
```

Arguments

formula	A formula indicating the regression model.
M	The dependence network.
directed	Whether the dependence network is directed or undirected.
mcorr	Whether request multiple correlation coefficients to distinguish triadic, mutual, and asymmetric error dependence.
CSE	Whether use clustered standard error for the residual regression. Default cluster is the ego unit.
k	The number of iterations in the fgls estimation.
data	The data that are used for the regression.

Details

The function estimates a multivariate regression model for analyzing outcomes with network dependence. One nice feature of the function is that it can distinguish three types of error dependence, including triadic dependence, mutual dependence, and asymmetric dependence.

Value

A list containing the coefficient `coef`, the testing results on the error correlations `rtest`, the estimated error variance `Sigma`, the estimated error correlation matrix `Omega`, and the OLS estimates `ols`.

References

An, Weihua. 2023. "A Tale of Twin-Dependence: A New Multivariate Regression Model and an FGLS Estimator for Analyzing Outcomes with Network Dependence." *Sociological Methods and Research* 52(4): 1947-1980.

Greene, William H. (2008). *Econometric Analysis* (6th edition). New Jersey: Pearson Prentice Hall.

Examples

```
data(dat)

g <- fglsnet(Y~ X-1, M = dat$M, directed = TRUE, mcorr = 1, k = 5, data = dat)

g$coef
```

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