Package ‘SLTCA’

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Type Package

Title Scalable and Robust Latent Trajectory Class Analysis


Depends R (>= 3.3.0)

Imports stats, geepack, VGAM, Matrix, mvtnorm

Version 0.1.0

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BugReports https://github.com/tengfei-emory/SLTCA/issues

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Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

NeedsCompilation no

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**simulation**  
*Simulate a dataset which can be analyzed by SLTCA*

### Description

Simulate a dataset with longitudinal observations.

### Usage

`simulation(n)`

### Arguments

- **n**  
  Sample size.

### Value

Returns a data frame with 6 longitudinal features y.1 - y.6, including count (y.1 and y.2), binary (y.3 and y.4) and continuous (y.5 and y.6) type. Variable baselinecov is the baseline risk factor of latent classes. Variable latent is the true latent class labels.

### Author(s)

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### References


### Examples

```
dat <- simulation(500)
```
Usage

SLTCA(
    k = 20,
    dat,
    num_class,
    id,
    time,
    num_obs,
    features,
    Y_dist,
    covx,
    ipw,
    stop,
    tol = 0.005,
    max = 50,
    varest = TRUE,
    balanced = TRUE,
    MSC = "EQIC",
    verbose = TRUE
)

Arguments

k  Number of random initialization to start the algorithm.
dat Input data matrix.
num_class Number of latent classes in the fitted model.
id Column name in the data matrix `dat` for the patient id.
time Column name in the data matrix `dat` for the time of longitudinal observations.
num_obs Column name in the data matrix `dat` for the number of longitudinal observations (number of visits).
features A vector of column names in the data matrix `dat` for the longitudinal observations.
Y_dist A vector indicating the type of longitudinal observations. An element of Y_dist can be `normal`, `bin`, and `poi` for continuous, binary and count data.
covx A vector of column names in the data matrix `dat` for baseline latent class risk factors.
ipw Column name in the data matrix `dat` for the inverse probability weights for missingness. ipw=1 if not specified.
stop Stopping criterion for the algorithm. stop can be either `tau` based on posterior probabilities or `par` based on point estimation.
tol A constant such that the algorithm stops if the stopping criterion is below this constant.
max Maximum number of iterations if the algorithm does not converge.
varest True or False: whether conduct variance estimation or not.
balanced True or False: whether the longitudinal observations are equally spaced.
MSC Model selection criteria: ‘AQIC’, ‘BQIC’ or ‘EQIC’.
verbose Output progress of fitting the model.

Value
A list with point estimates (alpha, beta0, beta1, phi, gamma), variance estimates (ASE), posterior membership probabilities (tau), QICs (qic) of the latent trajectory class model, and stopping criteria (diff) at the last iteration. Point estimates and variance estimates are provided in matrix format, where columns represent latent classes and rows represent covariates or longitudinal features.

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References

Examples

```r
# In this illustrative example the sample size is set as n=50,
# variance estimation is skipped by setting varest=FALSE, and
# the maximum number of iterations is set as max=1 in order to pass CRAN test.
# Please use n=500, varest=TRUE and max=50 for more reliable results.

dat <- simulation(n=50)
res <- SLTCA(k=1,dat,num_class=2,"id","time","num_obs",paste("y.",1:6,sep=''),
            Y_dist=c("poi","poi","bin","bin","normal","normal"),
            "baselinecov",1,stop="tau",tol=0.005,max=1,
            varest=FALSE,balanced=TRUE,MSC='EQIC',verbose=FALSE)
```
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