Package 'dynUtils'

March 18, 2024

Title Dynamic Modeling Utilities

Version 0.0.0.9000

Description Utility functions for data preparation when fitting dynamic models.

URL https://github.com/jeksterslab/dynUtils,
https://jeksterslab.github.io/dynUtils/

BugReports https://github.com/jeksterslab/dynUtils/issues

License GPL (>= 3)

Encoding UTF-8

Roxygen list(markdown = TRUE)

VignetteBuilder knitr

Depends R (>= 3.5.0)

Suggests knitr, rmarkdown, testthat, simStateSpace

RoxygenNote 7.3.1

NeedsCompilation no

Author Ivan Jacob Agaloos Pesigan [aut, cre, cph]
(<https://orcid.org/0000-0003-4818-8420>)

Maintainer Ivan Jacob Agaloos Pesigan <r.jeksterslab@gmail.com>

R topics documented:

`DeleteInitialNA` *Delete for NAs in Initial Row By ID*

Description

Deletes the initial row by ID if there are missing values. The function does this recursively until the first row per ID does not have missing observations.

Usage

```
DeleteInitialNA(data, id, time, observed, covariates = NULL, ncores = NULL)
```

Arguments

`data`	Data frame. A data frame object of data for potentially multiple subjects that contain a column of subject ID numbers (i.e., an ID variable), a column indicating subject-specific measurement occasions (i.e., a TIME variable), at least one column of observed values.
`id`	Character string. A character string of the name of the ID variable in the data.
`time`	Character string. A character string of the name of the TIME variable in the data.
`observed`	Character vector. A vector of character strings of the names of the observed variables in the data.
`covariates`	Character vector. A vector of character strings of the names of the covariates in the data.
`ncores`	Positive integer. Number of cores to use. If `ncores = NULL`, use a single core. Consider using multiple cores when number of individuals is large.

Value

Returns a data frame.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Dynamic Modeling Utility Functions: `InitialNA()`, `InsertNA()`, `SubsetByID()`

Examples

```
# prepare parameters
set.seed(42)
## number of individuals
n <- 5
## time points
time <- 5
## dynamic structure
p <- 3
mu0 <- rep(x = 0, times = p)
sigma0 <- 0.001 * diag(p)
sigma0_l <- t(chol(sigma0))
alpha <- rep(x = 0, times = p)
beta <- 0.50 * diag(p)
psi <- 0.001 * diag(p)
psi_l <- t(chol(psi))

library(simStateSpace)
ssm <- SimSSMVARFixed(
  n = n,
  time = time,
  mu0 = mu0,
  sigma0_l = sigma0_l,
  alpha = alpha,
  beta = beta,
  psi_l = psi_l,
  type = 0
)
data <- as.data.frame(ssm)
# Replace first row with NA
data[1, paste0("y", 1:p)] <- NA
DeleteInitialNA(
  data = data,
  id = "id",
  time = "time",
  observed = paste0("y", 1:p),
)
```

`InitialNA` *Check for NAs in Initial Row By ID*

Description

Check for NAs in Initial Row By ID

Usage

```
InitialNA(data, id, time, observed, covariates = NULL, ncores = NULL)
```

Arguments

data	Data frame. A data frame object of data for potentially multiple subjects that contain a column of subject ID numbers (i.e., an ID variable), a column indicating subject-specific measurement occasions (i.e., a TIME variable), at least one column of observed values.
id	Character string. A character string of the name of the ID variable in the data.
time	Character string. A character string of the name of the TIME variable in the data.
observed	Character vector. A vector of character strings of the names of the observed variables in the data.
covariates	Character vector. A vector of character strings of the names of the covariates in the data.
ncores	Positive integer. Number of cores to use. If ncores = NULL, use a single core. Consider using multiple cores when number of individuals is large.

Value

Returns a vector of ID numbers where the initial row has any missing value.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Dynamic Modeling Utility Functions: DeleteInitialNA(), InsertNA(), SubsetByID()

Examples

```
# prepare parameters
set.seed(42)
## number of individuals
n <- 5
## time points
time <- 5
## dynamic structure
p <- 3
mu0 <- rep(x = 0, times = p)
sigma0 <- 0.001 * diag(p)
sigma0_l <- t(chol(sigma0))
alpha <- rep(x = 0, times = p)
beta <- 0.50 * diag(p)
psi <- 0.001 * diag(p)
psi_l <- t(chol(psi))

library(simStateSpace)
ssm <- SimSSMVARFixed(
  n = n,
  time = time,
```

```
  mu0 = mu0,
  sigma0_l = sigma0_l,
  alpha = alpha,
  beta = beta,
  psi_l = psi_l,
  type = 0
)
data <- as.data.frame(ssm)
# Replace first row with NA
data[1, paste0("y", 1:p)] <- NA
InitialNA(
  data = data,
  id = "id",
  time = "time",
  observed = paste0("y", 1:p),
)
```

`InsertNA` *Insert NAs for Missing Observations*

Description

Creates a sequence of time values using the smallest time-interval as starting point and the largest time-interval as end point with `delta_t` increments. This new sequence is added to the empirical time values. Rows with no observations for each specific time value are inserted as NAs.

Usage

```
InsertNA(data, id, time, observed, covariates = NULL, delta_t, ncores = NULL)
```

Arguments

`data`	Data frame. A data frame object of data for potentially multiple subjects that contain a column of subject ID numbers (i.e., an ID variable), a column indicating subject-specific measurement occasions (i.e., a TIME variable), at least one column of observed values.
`id`	Character string. A character string of the name of the ID variable in the data.
`time`	Character string. A character string of the name of the TIME variable in the data.
`observed`	Character vector. A vector of character strings of the names of the observed variables in the data.
`covariates`	Character vector. A vector of character strings of the names of the covariates in the data.
`delta_t`	Positive number. Time interval.
`ncores`	Positive integer. Number of cores to use. If `ncores = NULL`, use a single core. Consider using multiple cores when number of individuals is large.

Value

Returns a data frame.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Dynamic Modeling Utility Functions: DeleteInitialNA(), InitialNA(), SubsetByID()

Examples

```
# prepare parameters
set.seed(42)
## number of individuals
n <- 5
## time points
time <- 5
## dynamic structure
p <- 3
mu0 <- rep(x = 0, times = p)
sigma0 <- 0.001 * diag(p)
sigma0_l <- t(chol(sigma0))
alpha <- rep(x = 0, times = p)
beta <- 0.50 * diag(p)
psi <- 0.001 * diag(p)
psi_l <- t(chol(psi))

library(simStateSpace)
ssm <- SimSSMVARFixed(
  n = n,
  time = time,
  mu0 = mu0,
  sigma0_l = sigma0_l,
  alpha = alpha,
  beta = beta,
  psi_l = psi_l,
  type = 0
)
data <- as.data.frame(ssm)
InsertNA(
  data = data,
  id = "id",
  time = "time",
  observed = paste0("y", 1:p),
  delta_t = 0.10
)
```

print.dynutillist *Print Method for Object of Class* dynutillist

Description

Print Method for Object of Class dynutillist

Usage

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

Arguments

x	an object of class dynutillist.
...	further arguments.

Author(s)

Ivan Jacob Agaloos Pesigan

Examples

```
# prepare parameters
set.seed(42)
## number of individuals
n <- 5
## time points
time <- 5
## dynamic structure
p <- 3
mu0 <- rep(x = 0, times = p)
sigma0 <- 0.001 * diag(p)
sigma0_l <- t(chol(sigma0))
alpha <- rep(x = 0, times = p)
beta <- 0.50 * diag(p)
psi <- 0.001 * diag(p)
psi_l <- t(chol(psi))

library(simStateSpace)
ssm <- SimSSMVARFixed(
  n = n,
  time = time,
  mu0 = mu0,
  sigma0_l = sigma0_l,
  alpha = alpha,
  beta = beta,
  psi_l = psi_l,
  type = 0
```

```
)
data <- as.data.frame(ssm)
out <- SubsetByID(
  data = data,
  id = "id",
  time = "time",
  observed = paste0("y", 1:p)
)
print(out)
```

SubsetByID *Subset Data Set by ID*

Description

Creates a list of data frames for each ID.

Usage

```
SubsetByID(data, id, time, observed, covariates = NULL, ncores = NULL)
```

Arguments

data	Data frame. A data frame object of data for potentially multiple subjects that contain a column of subject ID numbers (i.e., an ID variable), a column indicating subject-specific measurement occasions (i.e., a TIME variable), at least one column of observed values.
id	Character string. A character string of the name of the ID variable in the data.
time	Character string. A character string of the name of the TIME variable in the data.
observed	Character vector. A vector of character strings of the names of the observed variables in the data.
covariates	Character vector. A vector of character strings of the names of the covariates in the data.
ncores	Positive integer. Number of cores to use. If ncores = NULL, use a single core. Consider using multiple cores when number of individuals is large.

Value

Returns a list by ID numbers.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Dynamic Modeling Utility Functions: DeleteInitialNA(), InitialNA(), InsertNA()

Examples

```
# prepare parameters
set.seed(42)
## number of individuals
n <- 5
## time points
time <- 5
## dynamic structure
p <- 3
mu0 <- rep(x = 0, times = p)
sigma0 <- 0.001 * diag(p)
sigma0_l <- t(chol(sigma0))
alpha <- rep(x = 0, times = p)
beta <- 0.50 * diag(p)
psi <- 0.001 * diag(p)
psi_l <- t(chol(psi))

library(simStateSpace)
ssm <- SimSSMVARFixed(
  n = n,
  time = time,
  mu0 = mu0,
  sigma0_l = sigma0_l,
  alpha = alpha,
  beta = beta,
  psi_l = psi_l,
  type = 0
)
data <- as.data.frame(ssm)
SubsetByID(
  data = data,
  id = "id",
  time = "time",
  observed = paste0("y", 1:p)
)
```

Index