

Package ‘dynUtils’

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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)

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R topics documented:

DeleteInitialNA	2
InitialNA	3
InsertNA	5
print.dynutillist	7
SubsetByID	8
Index	10

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

Description

The function removes the initial row by ID if it contains missing values. This process is repeated recursively until the first row per ID no longer has missing observations.

Usage

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

Arguments

<code>data</code>	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.
<code>id</code>	Character string. A character string of the name of the ID variable in the data.
<code>time</code>	Character string. A character string of the name of the TIME variable in the data.
<code>observed</code>	Character vector. A vector of character strings of the names of the observed variables in the data.
<code>covariates</code>	Character vector. A vector of character strings of the names of the covariates in the data.
<code>ncores</code>	Positive integer. Number of cores to use. If <code>ncores = NULL</code> , 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**

The function checks if there are missing values for the initial row by ID.

Usage

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

Arguments

<code>data</code>	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.
<code>id</code>	Character string. A character string of the name of the ID variable in the data.
<code>time</code>	Character string. A character string of the name of the TIME variable in the data.
<code>observed</code>	Character vector. A vector of character strings of the names of the observed variables in the data.
<code>covariates</code>	Character vector. A vector of character strings of the names of the covariates in the data.
<code>ncores</code>	Positive integer. Number of cores to use. If <code>ncores = NULL</code> , 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**

The function creates a sequence of time values. It starts with the smallest time value as the starting point and the largest time value as the endpoint. The sequence is incremented by `delta_t`. This new sequence is combined with the existing empirical time values. For any specific time value where there are no observations, NAs are inserted.

Usage

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

Arguments

<code>data</code>	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.
<code>id</code>	Character string. A character string of the name of the ID variable in the data.
<code>time</code>	Character string. A character string of the name of the TIME variable in the data.
<code>observed</code>	Character vector. A vector of character strings of the names of the observed variables in the data.
<code>covariates</code>	Character vector. A vector of character strings of the names of the covariates in the data.
<code>delta_t</code>	Positive number. Time interval.
<code>ncores</code>	Positive integer. Number of cores to use. If <code>ncores = NULL</code> , 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	<i>Print Method for Object of Class dynutillist</i>
-------------------	---

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**

The function 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

* **Dynamic Modeling Utility Functions**

- DeleteInitialNA, [2](#)
- InitialNA, [3](#)
- InsertNA, [5](#)
- SubsetByID, [8](#)

* **data**

- DeleteInitialNA, [2](#)
- InitialNA, [3](#)
- InsertNA, [5](#)
- SubsetByID, [8](#)

* **dynUtils**

- DeleteInitialNA, [2](#)
- InitialNA, [3](#)
- InsertNA, [5](#)
- SubsetByID, [8](#)

* **methods**

- print.dynutillist, [7](#)

DeleteInitialNA, [2](#), [4](#), [6](#), [9](#)

InitialNA, [2](#), [3](#), [6](#), [9](#)

InsertNA, [2](#), [4](#), [5](#), [9](#)

print.dynutillist, [7](#)

SubsetByID, [2](#), [4](#), [6](#), [8](#)