Package ‘simtimer’

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Type Package

Title Datetimes as Integers for Discrete-Event Simulations

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Description Handles datetimes as integers for the usage inside Discrete-Event Simulations (DES). The conversion is made using the internally generic function as.numeric() of the base package. DES is described in Simulation Modeling and Analysis by Averill Law and David Kelton (1999) <doi:10.2307/2288169>.

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LazyData TRUE

Suggests testthat, knitr, rmarkdown, microbenchmark

URL `http://github.com/ims-fhs/simtimer`

RoxygenNote 6.0.1

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

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R topics documented:

`as.datetime` *Back-transformation from a sim_datetime to a datetime*

Description

as.datetime() transforms a sim_datetime element (integer) to a regular datetime element (POSIXt)

Usage

```
as.datetime(sim_datetime, origin_date)
```

Arguments

`sim_datetime`	A sim_datetime (integer representing the passed seconds since origin_date)
`origin_date`	A datetime (POSIXt)

Value

datetime A POSIXt

Examples

```
origin_date <- as.POSIXct("2016-01-01 00:00:00", tz = "UTC")
as.datetime(60, origin_date)
# [1] "2016-01-01 00:01:00 UTC"
as.datetime(600, origin_date)
# [1] "2016-01-01 00:10:00 UTC"
as.datetime(as.sim_datetime(as.POSIXct("2016-01-02 00:00:00", tz = "UTC"), origin_date),
origin_date)
# [1] "2016-01-02 UTC"
```

`as.sim_datetime` *Transformation from a datetime to a sim_datetime*

Description

as.sim_datetime() transforms a regular datetime element (POSIXt) to a sim_datetime (integer representing the passed seconds since origin_date). The timezone (tz) will be ignored at the moment. Therefore tz of datetime and origin_date should be identical.

Usage

```
as.sim_datetime(datetime, origin_date)
```

Arguments

`datetime`	A datetime (POSIXt)
`origin_date`	A datetime (POSIXt)

Value

A sim_datetime

Examples

```
origin_date <- as.POSIXct("2016-01-01 00:00:00", tz = "UTC")
as.sim_datetime(as.POSIXct("2016-01-01 00:01:00", tz = "UTC"), origin_date)
# [1] 60
as.sim_datetime(as.POSIXct("2016-01-02 00:01:00", tz = "UTC"), origin_date)
# [1] 86460
```

`sim_date` *Date part of a sim_datetime*

Description

sim_date() returns the date part of a sim_datetime. Therefore sim_date() calculates the number of days (24h-intervals) that have passed since origin_date. If the origin_date of sim_datetime has a time component different than 00:00:00, the 24h-intervals are correlated to this particular time component.

Usage

```
sim_date(sim_datetime)
```

Arguments

`sim_datetime`	A sim_datetime (integer representing the passed seconds since origin_date)

Value

the number of days (24h-intervals) that have passed since origin_date

Examples

```
sim_date(24*60*60-1)
# [1] 0
sim_date(24*60*60)
# [1] 1
sim_date(452*24*60*60)
# [1] 452
origin_date <- as.POSIXct("2016-01-01 00:00:00", tz = "UTC")
sim_date(as.sim_datetime(as.POSIXct("2016-01-02 00:01:00", tz = "UTC"), origin_date))
# [1] 1
```

sim_time *Time part of a sim_datetime*

Description

sim_time() returns the time of a sim_datetime in seconds. The beginning of a day is defined by the time component of origin_date which defines the parameter sim_datetime.

Usage

```
sim_time(sim_datetime)
```

Arguments

sim_datetime	A sim_datetime (integer representing the passed seconds since origin_date)

Value

time in seconds (Range: 0-(24*60*60-1))

Examples

```
sim_time(200)
# [1] 200
sim_time(24*60*60-1)
# [1] 86399
sim_time(24*60*60)
# [1] 0
origin_date <- as.POSIXct("2016-01-01 00:00:00", tz = "UTC")
sim_time(as.sim_datetime(as.POSIXct("2016-01-01 00:01:00", tz = "UTC"), origin_date))
# [1] 60
sim_time(as.sim_datetime(as.POSIXct("2016-01-02 00:01:00", tz = "UTC"), origin_date))
# [1] 60
```

sim_wday *Weekday part of a sim_datetime*

Description

sim_wday() returns the weekday of a sim_datetime. It's crucial to use the same origin_date for sim_wday() than the origin_date that was used to generate the sim_datetime. sim_wday() uses the base R format(x, "%u") function.

Usage

```
sim_wday(sim_datetime, origin_date)
```

Arguments

`sim_datetime`	A sim_datetime (integer representing the passed seconds since origin_date)
`origin_date`	A datetime (POSIXt)

Value

A character, giving the weekday number ("1" = Monday, "2" = Tuesday, ..., "7" = Sunday)

Examples

```
origin_date <- as.POSIXct("2016-01-01 00:00:00", tz = "UTC")
sim_wday(60, origin_date)
sim_wday(3600,origin_date)
sim_wday(36*3600,origin_date)
```

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