Package 'KNMI'

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Title functions for retrieving historic and forecasted weather data from the Dutch meteorological institute KNMI

Version 0.0.1

Description This package provides functions to retrieve historic weather data from both the official Dutch meteorological institute (KNMI) and from the experimental WOW.nl site. The official site only returns data from the offical KNMI weather stations. For some stations, data goes back to 1900. The experimental stations have a limited set of variables and limited history (>Februari 16th 2015). In addition, a seven day forecast can be retrieved. Several processing functions are available, such as a function that calculates the Huglin- or VE-index. The package also contains two KNMI dataset with all historic data and with long term averages per decenium.

Depends R (>= 3.2.1)

Imports plyr, RCurl

License GPL-3

LazyData true

Encoding UTF-8

NeedsCompilation no

Author Bart van Hest [aut, cre]

Maintainer Bart van Hest <hestbv@gmail.com>

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date2DayOfYear *convert a date into an integer that represents the day of the year.*

Description

convert a date into an integer that represents the day of the year.

Usage

```
date2DayOfYear(datum)
```

Arguments

datum	the date that needs to be converted. Date class.

Value

an integer representing the day-of-the-year.

Examples

```
date2DayOfYear(as.Date("2015-01-01")) # expected value: 1
date2DayOfYear(as.Date("2015-12-31")) # expected value: 365
```

dayOfYear2Date *convert a 'day of the year'-value into a date.*

Description

convert a 'day of the year'-value into a date.

Usage

```
dayOfYear2Date(doy, year = format(Sys.Date(), format = "%Y"))
```

Arguments

doy	the day of the year that needs to be converted. Integer.
year	the year for which the day of the year is applicable. Integer. Default is the current year.

Value

the date corresponding to the day-of-the-year.

Examples

```
dayOfYear2Date(1) # '01-01-201x'
dayOfYear2Date(1, year=2010) # '01-01-2010'
dayOfYear2Date(0) # 'NA'
```

`delta.ljgem` *calculate the difference in days between the two ranges with daily values*

Description

This function determines the two dates in two ranges of values that have the most similar value. Next, the difference between the two days is calculated.

Usage

```
delta.ljgem(ac, knmi.langJarigGem)
```

Arguments

`dataframe`	containting the columns doy, value
`dataframe`	containting the columns doy, value

Value

difference in days between the two ranges with daily values.

`HuglinIndex` *calculate the Huglin index*

Description

This function calculates the Huglin index, which is one of the statistics that represents the total amount of heat in a season that is bennefical to the growth of plants. More specific, its used to measure the amount of warmth that is required by grapes to start growing, blosson and ripen.

Usage

```
HuglinIndex(dgg, startDate = paste(format(Sys.Date(), format = "%Y"),
  "01-01", sep = "-"), endDate = paste(format(Sys.Date(), format = "%Y"),
  "12-31", sep = "-"))
```

Arguments

dgg	dotaframe containing three mandatory columns; the day-of-the-year (doy), the daily mean temperature (gemTemp), the daily maximum temperature (maxTemp) and an optional column containing the year (jaar). Temperatures in degrees Celcius. The data frame can contain the ranges for multiple years.
startDate	the start of the summation interval, formatted as a string 'yyyy-mm-dd'. Defaults to the start of the year.
endDate	the end of the summation interval, formatted as a string 'yyyy-mm-dd'. Defaults to the end of the year.

Details

It is calculated as the cumulitive summation over the days of the year of the mean of the daily averagee temperature (in degrees Celcius) plus the daily maximum temperature, substracted with 10 (the temperature at wihch grapes start growing). This value is only added to the total when its positive. The value is multiplied by a correction for the latitude of the measurement location (1.06 for The Netherlands). The default summation interval, from the first of April until the end of September, has been altered to be able to deal with cool-climate winegrowing that requires a prolonged growing season.

Documentation: https://de.wikipedia.org/wiki/Huglin-Index

Value

dataframe containing the year (jaar), the day-of-the-year (doy) and the Huglin-index at the doy.

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knmi.langJarigGem *KNMI longterm averages*

Description

A dataset containing the longterm averages of measurements.

Usage

```
data(knmi.langJarigGem)
```

Format

A data frame with 13346 rows and 11 variables:

- station: ID of the station (210–391)
- dagVjaar: day of the year (1-366)
- gemTemp:
- gemMaxTemp:
- absMaxTemp:

- gemMinTemp:
- absMinTemp:
- gemNeerslag:
- gemZon:
- gemPercZon:
- gemStraling:

`retrieveHistoricData` *retrieve Historic Data*

Description

This function retrieves historic weather data collected by the official KNMI weather stations. You can specify a specific station or get data from all the stations at once (the default). When the from and to date parameters are not proviced, all measurements are returned. Otherwise the data is subsetted to the given interval.

Usage

```
retrieveHistoricData(station = "all", from = paste(format(Sys.Date(), format
  = "%Y"), "01-01", sep = "-"), to = format(Sys.Date() - 1, format =
  "%Y-%m-%d"))
```

Arguments

`station`	ID for the KNMI station. The available stations can be retrieved with the function 'getStations()'. Defaults to "all". . Note: a string of characters in the format 'iii'.
`from`	startdate for the time-window. Defaults to the start of the current year. Note: a string of characters in the format 'yyyymmdd'.
`to`	enddate for the time-window. Defaults to yesterday. Note: a string of characters in the format 'yyyymmdd'.

Format

A data frame with 35 rows and 4 variables:

- YYYYMMDD = Datum (YYYY=jaar MM=maand DD=dag);
- FG = Etmaalgemiddelde windsnelheid (in 0.1 m/s);
- TG = Etmaalgemiddelde temperatuur (in 0.1 graden Celsius);
- TN = Minimum temperatuur (in 0.1 graden Celsius);
- TX = Maximum temperatuur (in 0.1 graden Celsius);
- SQ = Zonneschijnduur (in 0.1 uur) berekend uit de globale straling (-1 voor <0.05 uur);
- SP = Percentage van de langst mogelijke zonneschijnduur;

- Q = Globale straling (in J/cm2);
- RH = Etmaalsom van de neerslag (in 0.1 mm) (-1 voor <0.05 mm);
- NG = Etmaalgemiddelde bewolking (bedekkingsgraad van de bovenlucht in achtsten, 9=bovenlucht onzichtbaar);

Value

a data frame containing the following columns.

`stations` *KNMI stations*

Description

A dataset containing the ID's and meta-data on the official KNMI measurement stations.

Usage

```
data(stations)
```

Format

A data frame with 35 rows and 4 variables:

- station: ID of the station (210–391)
- plaats: City where the station is located
- lon: geographical longitude (format: Decimal Degrees DDD.DDDDD°)
- lat: geographical latitude (format: Decimal Degrees DDD.DDDDD°)

`VEIndex` *calculate the VE index*

Description

This function calculates the VE index, which is one of the statistics that represents the total amount of heat in a season that is bennefical to the growth of plants. More specific, its used to measure the amount of warmth that is required by grapes to start growing, blosson and ripen.

Usage

```
VEIndex(dgg, startDate = paste(format(Sys.Date(), format = "%Y"), "01-01",
  sep = "-"), endDate = paste(format(Sys.Date(), format = "%Y"), "12-31", sep
  = "-"))
```

Arguments

dgg	dotaframe containing two mandatory columns; the day-of-the-year (doy), the daily mean temperature (gemTemp) and an optional column containing the year (jaar). Temperatures in degrees Celcius. The data frame can contain the ranges for multiple years.
startDate	the start of the summation interval, formatted as a string 'yyyy-mm-dd'. Defaults to the start of the year.
endDate	the end of the summation interval, formatted as a string 'yyyy-mm-dd'. Defaults to the end of the year.

Details

It is calculated as the cumulitive summation over the days of the year of the mean of the daily minimum temperature (in degrees Celcius) substracted with 10 (the temperature at wihch grapes start growing). This value is only added to the total when its positive. The default summation interval, from the first of April until the end of September, has been altered to be able to deal with cool-climate winegrowing that requires a prolonged growing season.

Documentation: https://de.wikipedia.org/wiki/Wachstumsgradtag

Value

dataframe containing the year (jaar), the day-of-the-year (doy) and the VE-index at the doy.

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