Package 'weatherindices'

May 8, 2026

Title Calculate Weather Indices

Version 0.1.0

Description Weather indices represent the overall weekly effect of a weather variable on crop yield throughout the cropping season. This package contains functions that can convert the weekly weather data into yearly weighted Weather indices with weights being the correlation coefficient between weekly weather data over the years and crop yield over the years. This can be done for an individual weather variable and for two weather variables at a time as the interaction effect. This method was first devised by Jain, RC, Agrawal R, and Jha, MP (1980), ``Effect of climatic variables on rice yield and its forecast",MAUSAM, 31(4), 591–596, <doi:10.54302/mausam.v31i4.3477>. Later, the method have been used by various researchers and the latest can found in Gupta, AK, Sarkar, KA, Dhakre, DS, & Bhattacharya, D (2022), ``Weather Based Potato Yield Modelling using Statistical and Machine Learning Technique",Environment and Ecology, 40(3B), 1444–1449,<https://www.environmentandecology.com/volume-40-2022>.

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.1.2

Depends R (>= 2.10)

LazyData true

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

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Contents

`Burdwanriceyield` *Yearly Yield data of rice in Burdwan district of West Bengal, India over 39 years*

Description

Contains the Years and yield data in Tonnes per hectare

Usage

```
Burdwanriceyield
```

Format

A data frame with 39 rows of 2 variables

Year starting year of data

burdwan rice yield data of burdwan district

Source

Bureau of Applied Economics and Statistics (BAES), Department of Planning, Statistics and Programme Monitoring (PSPM), Government of West Bengal and Area and Production Statistics portal (https://aps.dac.gov.in/APY/Public_Report1.aspx) of Ministry of Agriculture and Farmers Welfare, Government of India.

Examples

```
data(Burdwanriceyield)
```

Burdwanweather — *Weekly weather data for the rice growing season in Burdwan district of West Bengal, India over 39 years*

Description

Contains the date, standard meteorological week, week number and four weather variables

Usage

```
Burdwanweather
```

Format

A data frame with 741 rows of 7 variables

Date starting date of data

SMW Standard Meteorological Week

Week week number of crop growing season

Max.Temperature Daily Maximum temperature data averaged over week

Min.Temperature Daily Minimum temperature data averaged over week

Precipitation Daily Rainfall data summed over week

Relative.Humidity Daily Relative.Humidity data averaged over week

Source

NASA Power Data Access Viewer(https://power.larc.nasa.gov/data-access-viewer/)

Examples

```
data(Burdwanweather)
```

i.uwwi — *Un-weighted Interaction Weather Indices*

Description

Converts the weekly interaction of two weather variable into yearly weighted interaction weather indices

Usage

```
i.uwwi(y, weatherp1, weatherp2)
```

Arguments

y	A vector of yearly yield data for t years
weatherp1	Weekly weather data for t years as vector of first weather variable(total observations= number of years*number of weeks in each year)
weatherp2	Weekly weather data for t years as vector of second weather variable(total observations= number of years*number of weeks in each year)

Value

A vector of interaction weather indices

References

Jain, R. C., Agrawal, R., & Jha, M. P. (1980). Effect of climatic variables on rice yield and its forecast. MAUSAM, 31(4), 591-596.

Examples

```
data(Burdwanweather) #Weekly weather data for the rice growing season in Burdwan
data(Burdwanriceyield) #Yearly Yield data of rice  in Burdwan
i.uwwi.maxmintem<-i.uwwi(Burdwanriceyield$burdwan,Burdwanweather$Max.Temperature,
                         Burdwanweather$Min.Temperature)
i.uwwi.maxmintem
```

---

i.wwi *Weighted Interaction Weather Indices*

Description

Converts the weekly interaction of two weather variable into yearly weighted interaction weather indices with weights being the correlation coefficient between weekly weather data over the years and crop yield over the years

Usage

```
i.wwi(y, weatherp1, weatherp2)
```

Arguments

y	A vector of yearly yield data for t years
weatherp1	Weekly weather data for t years as vector for first weather variable(total observations= number of years*number of weeks in each year)
weatherp2	Weekly weather data for t years as vector for second weather variable(total observations= number of years*number of weeks in each year)

Value

A vector of interaction weather indices

References

Jain, R. C., Agrawal, R., & Jha, M. P. (1980). Effect of climatic variables on rice yield and its forecast. MAUSAM, 31(4), 591-596.

Examples

```
data(Burdwanweather) #Weekly weather data for the rice growing season in Burdwan
data(Burdwanriceyield) #Yearly Yield data of rice  in Burdwan
i.wwi.maxmintem<-i.wwi(Burdwanriceyield$burdwan,Burdwanweather$Max.Temperature,
                       Burdwanweather$Min.Temperature)
i.wwi.maxmintem
```

---

uwwi *Un-weighted Weather Indices*

Description

Converts the weekly weather data into yearly un-weighted weather indices(simply averaged)

Usage

```
uwwi(y, weatherp)
```

Arguments

y	A vector of yearly yield data for t years
weatherp	Weekly weather data for t years as vector (total observations= number of years*number of weeks in each year)

Value

A vector of weather indices

References

Jain, R. C., Agrawal, R., & Jha, M. P. (1980). Effect of climatic variables on rice yield and its forecast. MAUSAM, 31(4), 591-596.

Examples

```
data(Burdwanweather) #Weekly weather data for the rice growing season in Burdwan
data(Burdwanriceyield) #Yearly Yield data of rice  in Burdwan
wwi.maxtem<-wwi(Burdwanriceyield$burdwan,Burdwanweather$Max.Temperature)
wwi.maxtem
```

wwi *Weighted Weather Indices*

Description

Converts the weekly weather data into yearly weighted weather indices with weights being the correlation coefficient between weekly weather data over the years and crop yield over the years

Usage

```
wwi(y, weatherp)
```

Arguments

y	A vector of yearly yield data for t years
weatherp	Weekly weather data for t years as vector (total observations= number of years*number of weeks in each year)

Value

A vector of weather indices

References

Jain, R. C., Agrawal, R., & Jha, M. P. (1980). Effect of climatic variables on rice yield and its forecast. MAUSAM, 31(4), 591-596.

Examples

```
data(Burdwanweather) #Weekly weather data for the rice growing season in Burdwan
data(Burdwanriceyield) #Yearly Yield data of rice  in Burdwan
wwi.maxtem<-wwi(Burdwanriceyield$burdwan,Burdwanweather$Max.Temperature)
wwi.maxtem
```

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