Package ‘sgstar’

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| coords | Coordinate of region in South Sumatera |

**Description**

A simple tibble dataset containing the coordinate region in South.

**Usage**

cords

**Format**

A tibble with 17 rows as Region/City and 2 columns, which are:

- **"Longitude"**: longitude coordinate for each location
- **"Latitude"**: latitude coordinate for each location

**Source**

https://www.bps.go.id/

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**plot_sgstar**

**Timeseries Plot for Model**

**Description**

Plotting line chart dataset and fit.values of the Seasonal GSTAR model.

**Usage**

plot_sgstar(formula)

**Arguments**

- formula: an object from the output from sgstar() function.

**Value**

returns output a list that shown line chart for each location.
Examples

```r
library(sgstar)
data("coords")
data("simulatedata")

# create weight matrix using distance inverse matrix
z<-dist(coords,method = "euclidean")
z <- as.matrix(z)
matriksd <- 1/z
matriksd[is.infinite(matriksd)] <- 0
matriksd_w <- matriksd / rowSums(as.data.frame(matriksd))

fit <- sgstar(data = simulatedata, w = matriksd_w, p = 2, ps = 1, s =4)
plot1 <- plot_sgstar(fit)
```

**predict_sgstar**

*Predict for Seasonal GSTAR model.*

**Description**

Predicting value based on Sgstar object

**Usage**

`predict_sgstar(formula, n_time)`

**Arguments**

- `formula`: an object from the output from sgstar() function.
- `n_time`: number of steps ahead for which prediction is required.

**Value**

returns output a dataframe that shown predict value based on model, with rows as time and column that shown for each location.

**References**

Examples

```r
library(sgstar)
data("coords")
data("simulatedata")

# create weight matrix using distance inverse matrix
z <- dist(coords, method = "euclidean")
z <- as.matrix(z)
matriksd <- 1/z
matriksd[is.infinite(matriksd)] <- 0
matriksd_w <- matriksd / rowSums(as.data.frame(matriksd))

fit <- sgstar(data = simulatedata, w = matriksd_w, p = 2, ps = 1, s = 4)
# predicting for 12 time ahead
predict.fit <- predict_sgstar(fit, 12)
```

sgstar  

*Fit Seasonal Generalized Space Time Autoregressive Model*

Description

sgstar function return the parameter estimation of Seasonal Generalized Space Time Autoregressive Model by using Generalized Least Square (GLS)

Usage

```r
sgstar(data, w, p, ps, s)
```

Arguments

- **data**: A dataframe that contain timeseries data with k column as space and n rows as time.
- **w**: a spatial weight, matrix ncol(data) * ncol(data) with diagonal = 0.
- **p**: an autoregressive order, value must be greater than 0.
- **ps**: an autoregressive order for seasonal, value must be greater than 0.
- **s**: an order of the seasonal period

Value

sgstar returns output with detail are shown in the following list:

- **Coefficients**: coefficients parameter model for each location
- **Fitted.Values**: a dataframe with fit value for each location based on model
Residual a dataframe that contain residual, that is response minus fitted values based on model

Performance a dataframe containing the following objects:

- MSE : Mean Squared Error (MSE) for all the data combined.
- RMSE : Root Mean Squared Error (RMSE) for all the data combined.
- AIC : a Version of Akaike’s Information Criterion (AIC)
- Rsquared : R^2, the ‘fraction of variance explained by the model’.

p an autoregressive order
ps an autoregressive order for seasonal
s an order of the seasonal period
weight a spatial weight
data a dataset that used in modeling

References


Examples

library(sgstar)
data("coords")
data("simulatedata")
# create weight matrix using distance inverse matrix
z<-dist(coords,method = "euclidean")
z <- as.matrix(z)
matriksd <- 1/z
matriksd[is.infinite(matriksd)] <- 0
matriksd_w <- matriksd / rowSums(as.data.frame(matriksd))

fit <- sgstar(data = simulatedata, w = matriksd_w, p = 2,ps = 1, s =4)
fit
**Description**

A simple tibble that is generate from random normal distribution for simulate seasonal generalized space-time autoregressive model.

**Usage**

`simulatedata`

**Format**

A tibble with 100 observation time and 17 column as location, which are:

- "PALEMBANG" a value dataset for PALEMBANG
- "LUBUKLINGGAU" a value dataset for LUBUKLINGGAU
- "OGAN KOMERING ULU SELATAN" a value dataset for OGAN KOMERING ULU SELATAN
- "OGAN KOMERING ULU" a value dataset for OGAN KOMERING ULU
- "OGAN KOMERING ILIR" a value dataset for OGAN KOMERING ILIR
- "MUSI RAWAS" a value dataset for MUSI RAWAS
- "OGAN ILIR" a value dataset for OGAN ILIR
- "PAGAR ALAM" a value dataset for PAGAR ALAM
- "BANYU ASIN" a value dataset for BANYU ASIN
- "OGAN KOMERING ULU TIMUR" a value dataset for OGAN KOMERING ULU TIMUR
- "EMPAT LAWANG" a value dataset for EMPAT LAWANG
- "PRABUMULIH" a value dataset for EMPAT LAWANG
- "LAHAT" a value dataset for LAHAT
- "MUSI RAWAS UTARA" a value dataset for MUSI RAWAS UTARA
- "PENUKAL ABAB LEMATANG ILIR" a value dataset for PENUKAL ABAB LEMATANG ILIR
- "MUARA ENIM" a value dataset for MUARA ENIM
- "MUSI BANYUASIN" a value dataset for MUSI BANYUASIN
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