Package 'EcoMetrics'

May 7, 2026

Title Econometrics Model Building

Version 0.1.1

Description An intuitive and user-friendly package designed to aid undergraduate students in understanding and applying econometric methods in their studies,
Tailored specifically for Econometrics and Regression Modeling courses, it provides a practical toolkit for modeling and analyzing econometric data with detailed inference capabilities.

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Encoding UTF-8

RoxygenNote 7.3.2

Imports car, forecast, ggplot2, insight, lmtest, moments, stats, tibble, tseries

Depends R (>= 2.10)

LazyData true

Suggests knitr

NeedsCompilation no

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Repository CRAN

Date/Publication 2025-01-28 16:30:06 UTC

Contents

`ACF_PLOT` *Plots ACF of a univariate time series*

Description

Plots ACF of a univariate time series

Usage

```
ACF_PLOT(x, lag.max = NULL)
```

Arguments

`x`	numeric vector
`lag.max`	maximum lag to calculate the acf

Value

a plot of the acf vs lag

Author(s)

Mutua Kilai

Examples

```
data(keconomy)
attach(keconomy)
ACF_PLOT(UR)
```

autocorrelation_assumption *Check model for residual independence*

Description

Checks model for independence of residuals

Usage

```
autocorrelation_assumption(model)
```

Arguments

model	A lm object

Value

returns the p-value for the test

Author(s)

Mutua Kilai

Examples

```
model <- lm(pi ~ hs + ps, data = eduperform)
autocorrelation_assumption(model)
```

best_arima *Select Optimal Model based on BIC*

Description

Select Optimal Model based on BIC

Usage

```
best_arima(data, max_p = 5, max_d = 2, max_q = 5)
```

Arguments

data	A univariate ts object
max_p	Maximum AR order
max_d	Maximum differencing order
max_q	Maximum MA order

Value

A list containing the optimal model results and the BIC value

Examples

```
data(keconomy)
attach(keconomy)
best_arima(UR, max_p = 5, max_d = 2, max_q = 5)
```

`check_model_sig` *Checking Overall Model Significance*

Description

Checking Overall Model Significance

Usage

```
check_model_sig(data, y, x)
```

Arguments

`data`	A data frame containing the variables to use
`y`	The dependent variable
`x`	A set of independent variables

Value

p-value with a statement on whether the model is significant or not

Author(s)

Mutua Kilai

Examples

```
check_model_sig(data = eduperform, "pi", c("hs", "ps"))
```

check_stationarity *Check Series for Weak Stationarity*

Description

Check Series for Weak Stationarity

Usage

```
check_stationarity(x)
```

Arguments

x	A numeric vector or time series object

Value

p-value of the test

Author(s)

Mutua Kilai

Examples

```
data(keconomy)
attach(keconomy)
check_stationarity(UR)
```

eduperform *Student Performance Data*

Description

Student performance dataset is a dataset designed to examine the factors influencing academic student performance.

Usage

```
eduperform
```

Format

eduperform:
A data frame with 10000 rows and 6 columns:

hs hours studied
ps previous score
ea extracurricula activities
sh sleep hours
sqpp sample question paper practiced
pi performance Index ...

Source

https://www.kaggle.com/datasets/nikhil7280/student-performance-multiple-linear-regression?resource=download

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fit_arima *Fit ARIMA models to univariate data*

Description

Fit ARIMA models to univariate data

Usage

```
fit_arima(data, p, d, q)
```

Arguments

data	a univariate class object or a vector
p	AR order
d	differencing order
q	MA order

Value

A tibble containing the estimate, SE and p-value

Examples

```
data(keconomy)
attach(keconomy)
fit_arima(UR, p=2,d=0,q=3)
```

get_coefficients_variance *Get variance of the model coefficients*

Description

Get variance of the model coefficients

Usage

```
get_coefficients_variance(data, y, x)
```

Arguments

data	A data frame containing the variables to use
y	The dependent variable
x	A set of independent variables

Value

Tibble containing the variances

Author(s)

Mutua Kilai

Examples

```
get_coefficients_variance(data = eduperform, "pi", c("hs", "ps"))
```

get_confint *Confidence Intervals of Model Parameters*

Description

Confidence Intervals of Model Parameters

Usage

```
get_confint(data, y, x, level = 0.95)
```

Arguments

data	A data frame containing the variables to use
y	The dependent variable
x	A set of independent variables
level	level of significance can be 0.95, 0.90 etc. default is 0.95

Value

tibble containing the lower and upper confidence intervals

Author(s)

Mutua Kilai

Examples

```
get_confint(data = eduperform, "pi", c("hs", "ps"))
```

---

get_significant_predictors

Obtaining only significant predictors from a model

Description

Obtaining only significant predictors from a model

Usage

```
get_significant_predictors(data, y, x, alpha = 0.05)
```

Arguments

data	A data frame containing the variables to use
y	The dependent variable
x	A set of independent variables
alpha	desired alpha level. default is 0.05

Value

A tibble containing the significant predictors

Author(s)

Mutua Kilai

Examples

```
get_significant_predictors(data = eduperform, "pi", c("hs", "ps"))
```

`heteroscedasticity_assumption` *Checking heteroscedasticity assumption*

Description

Checking heteroscedasticity assumption

Usage

```
heteroscedasticity_assumption(model)
```

Arguments

`model`	A lm model object

Value

The p-value of the test statistic.

Author(s)

Mutua Kilai

Examples

```
model <- lm(pi ~ hs + ps, data = eduperform)
heteroscedasticity_assumption(model)
```

keconomy *Kenya Unemployment Rate and GDP Growth rate for 1999-2023*

Description

Annual Time Series data for Kenyan Economy showing the unemployment rate and GDP Growth Rate.

Usage

```
keconomy
```

Format

`keconomy`**:**

A data frame with 25 rows and 3 columns:

Year Year; from 1999 to 2023

UR Unemployment Rate

GR GDP Growth Rate

Source

https://www.statista.com

multicollinearity_assumption *Multicollinearity Assumption*

Description

Multicollinearity Assumption

Usage

```
multicollinearity_assumption(model)
```

Arguments

`model`	A lm object

Value

A tibble containing the VIF and Tolerance values

Author(s)

Mutua Kilai

Examples

```
model <- lm(pi ~ hs + ps, data = eduperform)
multicollinearity_assumption(model)
```

---

normality_assumption *Checking normality of residuals*

Description

Checking normality of residuals

Usage

```
normality_assumption(model)
```

Arguments

model	A lm model object

Value

The p-value of the test statistic.

Author(s)

Mutua Kilai

Examples

```
model <- lm(pi ~ hs + ps, data = eduperform)
normality_assumption(model)
```

ols_model *Fitting a simple or multiple linear regression*

Description

Fitting a simple or multiple linear regression

Usage

```
ols_model(data, y, x)
```

Arguments

data	A data frame containing the variables to use
y	The dependent variable
x	Set of independent variables

Value

A tibble of the coefficients, standard errors, t-statistics and p-value

Author(s)

Mutua Kilai

Examples

```
ols_model(data = eduperform, "pi", c("hs", "ps"))
```

ols_model_sig *F-statistic attributes*

Description

F-statistic attributes

Usage

```
ols_model_sig(data, y, x)
```

Arguments

data	A data frame containing the variables to use
y	The dependent variable
x	Set of independent variables

Value

A tibble containing the number of observations, F-Statistic, degrees of freedom and p-value

Author(s)

Mutua Kilai

Examples

```
ols_model_sig(data = eduperform, "pi", c("hs", "ps"))
```

`ols_model_stats` *Model Summary Statistics*

Description

Model Summary Statistics

Usage

```
ols_model_stats(data, y, x)
```

Arguments

`data`	A data frame containing the variables to use
`y`	The dependent variable
`x`	The independent variables

Value

A tibble containing model summary stats: R-Squared, Adjusted R-Squared, AIC and BIC

Author(s)

Mutua Kilai

Examples

```
ols_model_stats(data = eduperform, "pi", c("hs", "ps"))
```

PACF_PLOT *Plots PACF of a univariate time series*

Description

Plots PACF of a univariate time series

Usage

```
PACF_PLOT(x, lag.max = NULL)
```

Arguments

x	a numeric vector
lag.max	maximum lag to calculate pacf

Value

a plot of the pacf vs lag

Author(s)

Mutua Kilai

Examples

```
data(keconomy)
attach(keconomy)
PACF_PLOT(UR)
```

predict_dep_var *Prediction from new observations*

Description

Prediction from new observations

Usage

```
predict_dep_var(model, new_data, level = 0.95)
```

Arguments

model	an lm object
new_data	data frame containing the new set of predictors
level	confidence level, default 0.95

Value

A tibble containing the predicted value and the upper and lower CI

Author(s)

Mutua Kilai

Examples

```
model <- lm(pi ~ hs + ps, data = eduperform)
newdata <- data.frame(hs =c(2,3,4),ps = c(23,24,12))
predict_dep_var(model, new_data = newdata, level = 0.95)
```

---

select_optimal_model *Choosing Best Model Based on AIC, BIC and Adjusted R Squared*

Description

Choosing Best Model Based on AIC, BIC and Adjusted R Squared

Usage

```
select_optimal_model(models, criterion = "AIC")
```

Arguments

models	a list of models
criterion	The criterion to select optimal model. Default AIC

Value

list of the results and best model

Author(s)

Mutua Kilai

Examples

```
data(eduperform)
model1 <- lm(pi ~ hs, data = eduperform)
model2 <- lm(pi ~ hs + ps, data = eduperform)
model3 <- lm(pi ~ hs + ps + sh, data = eduperform)
models <- list(model1, model2, model3)

select_optimal_model(models, criterion= "AIC")
```

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