Package: modeldiag (via r-universe)

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Type Package

Title Comprehensive Diagnostics for Statistical Models

Version 0.1.0

Description Provides a unified framework for diagnosing common issues in statistical models including linear models, generalized linear models (logistic and Poisson regression), and survival models. Implements tests for multicollinearity, heteroscedasticity, autocorrelation, normality, influential observations, overdispersion, zero-inflation, and proportional hazards assumptions. Includes visualization methods for graphical diagnostics. Methods are based on established approaches including Fox and Monette (1992) <doi:10.1080/01621459.1992.10475190>, Breusch and Pagan (1979) <doi:10.2307/1911963>, and Dean and Lawless (1989) <doi:10.1080/01621459.1989.10478792>.

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URL https://github.com/Teniola17/modeldiag

BugReports https://github.com/Teniola17/modeldiag/issues

Depends R (>= 3.5.0)

Imports stats, graphics, car, lmtest, ResourceSelection, survival

Suggests testthat (>= 3.0.0), knitr, rmarkdown

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VignetteBuilder knitr

Config/testthat/edition 3

NeedsCompilation no

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Contents

check_heteroskedasticity 2
check_vif 3
diagnose_model.glm 3
plot.model_diagnostics 4
print.model_diagnostics 5
summary.model_diagnostics 5

Index **6**

`check_heteroskedasticity` *Check Heteroskedasticity*

Description

Performs Breusch-Pagan test for heteroskedasticity.

Usage

```
check_heteroskedasticity(model)
```

Arguments

`model`	A fitted lm object.

Value

An htest object or NA if computation fails.

check_vif *Check Variance Inflation Factors*

Description

Computes variance inflation factors to detect multicollinearity.

Usage

```
check_vif(model)
```

Arguments

model	A fitted model object.

Value

A numeric vector of VIF values or NA if computation fails.

diagnose_model.glm *Diagnose Statistical Models*

Description

This is a generic function for performing diagnostic checks on statistical models. It dispatches to specific methods based on the model type.

Usage

```
## S3 method for class 'glm'
diagnose_model(model, ...)

## S3 method for class 'lm'
diagnose_model(model, ...)

## S3 method for class 'coxph'
diagnose_model(model, ...)

diagnose_model(model, ...)
```

Arguments

model	A fitted model object.
...	Additional arguments passed to specific methods.

Value

An object of class "model_diagnostics" containing the results of various diagnostic tests.

Examples

```
# Linear model diagnostics
model_lm <- lm(mpg ~ wt + hp, data = mtcars)
diag_lm <- diagnose_model(model_lm)
summary(diag_lm)
plot(diag_lm)

# Logistic regression diagnostics
model_glm <- glm(am ~ wt + hp, data = mtcars, family = binomial)
diag_glm <- diagnose_model(model_glm)
summary(diag_glm)

# Poisson regression diagnostics
model_pois <- glm(carb ~ wt + hp, data = mtcars, family = poisson)
diag_pois <- diagnose_model(model_pois)
summary(diag_pois)

# Cox proportional hazards diagnostics
library(survival)
data(lung)
model_cox <- coxph(Surv(time, status) ~ age + sex + ph.ecog, data = lung)
diag_cox <- diagnose_model(model_cox)
summary(diag_cox)
```

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plot.model_diagnostics

Plot Model Diagnostics

Description

Generates diagnostic plots for the fitted model.

Usage

```
## S3 method for class 'model_diagnostics'
plot(x, ...)
```

Arguments

x	An object of class "model_diagnostics".
...	Additional arguments passed to plotting functions.

Value

None (plots are displayed).

print.model_diagnostics *Print Model Diagnostics*

Description

Prints a summary of the model diagnostics object.

Usage

```
## S3 method for class 'model_diagnostics'
print(x, ...)
```

Arguments

x	An object of class "model_diagnostics".
...	Additional arguments passed to print.

Value

The object x, invisibly.

summary.model_diagnostics *Summarize Model Diagnostics*

Description

Provides a detailed summary of diagnostic test results.

Usage

```
## S3 method for class 'model_diagnostics'
summary(object, ...)
```

Arguments

object	An object of class "model_diagnostics".
...	Additional arguments (currently ignored).

Value

The object, invisibly.

Index

check_heteroskedasticity, 2
check_vif, 3

diagnose_model *(*diagnose_model.glm*)*, 3
diagnose_model.glm, 3

plot.model_diagnostics, 4
print.model_diagnostics, 5

summary.model_diagnostics, 5