

# Package ‘modeldiag’

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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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**Encoding** UTF-8

**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

**RoxygenNote** 7.3.3

**VignetteBuilder** knitr

**Config/testthat/edition** 3

**NeedsCompilation** no

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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*

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### 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*

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### **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.

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