Package 'OLSengine'

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Title Transparent and Assisted Linear Modeling Engine

Version 1.0.0

Description A transparent, modular, and base-R implemented statistical engine for linear regression (OLS), analysis of variance (ANOVA), and logistic regression (Logit). Designed under the principle of ``assisted simplicity'', it features an integrated methodological ``customs'' (Aduana) that automatically audits mathematical assumptions (e.g., multicollinearity, heteroskedasticity, normality, and perfect separation) and outputs publication-ready, APA-formatted tables. It deliberately avoids hidden heuristics and external dependencies, ensuring computational transparency and reproducibility for applied research.

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URL https://github.com/msoto-perez/OLSEngine

BugReports https://github.com/msoto-perez/OLSEngine/issues

Encoding UTF-8

RoxygenNote 7.3.3

VignetteBuilder knitr

Suggests knitr, rmarkdown

NeedsCompilation no

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paper_engine *Transparent and Assisted Linear Modeling Engine*

Description

Estimates OLS regression, ANOVA/t-tests, or binary logistic regression models using pure base R matrix algebra. Automatically audits statistical assumptions through an integrated methodological customs layer and returns publication-ready APA-formatted tables. Designed for applied researchers and early-career academics who need a single, transparent workflow from estimation to reporting.

Usage

```
paper_engine(
  formula,
  data,
  model = "ols",
  robust = FALSE,
  non_parametric = FALSE,
  paired = FALSE,
  digits = 2
)
```

Arguments

formula	A formula object specifying the model (e.g., y ~ x1 + x2).
data	A data frame containing all variables referenced in formula.
model	A character string indicating the estimation engine. One of "ols" (default), "anova", or "logit".
robust	Logical or "auto". Controls heteroskedasticity-robust standard errors (HC3) for OLS models. If TRUE, HC3 SEs are always applied. If "auto", they are applied only when the Breusch-Pagan test detects heteroskedasticity ($p < .05$). Default is FALSE.
non_parametric	Logical or "auto". Controls non-parametric fallback for ANOVA/t-test models. If TRUE, Kruskal-Wallis or Wilcoxon tests are used. If "auto", transition occurs when Shapiro-Wilk detects non-normality ($p < .05$). Default is FALSE.
paired	Logical. If TRUE, assumes paired/dependent samples for ANOVA/t-test models (pre-post designs). Default is FALSE.
digits	Integer. Number of decimal places in output tables. Default is 2.

Value

An object of class basic_model, which is a list containing:

tables A list of formatted data frames with estimation results.

diagnostics A list of raw diagnostic statistics (p-values, fit indices).

messages A character vector of methodological guidance messages from the customs layer.

method A character string indicating the engine used (`"ols"`, `"anova"`, or `"logit"`).

data The cleaned data frame used for estimation (after listwise deletion).

Examples

```
# OLS example
set.seed(42)
df <- data.frame(y = rnorm(100), x1 = rnorm(100), x2 = rnorm(100))
result <- paper_engine(y ~ x1 + x2, data = df, model = "ols")
print(result$tables)
print(result$messages)

# ANOVA example
df2 <- data.frame(score = c(rnorm(30, 5), rnorm(30, 7)),
                  group = rep(c("A", "B"), each = 30))
result2 <- paper_engine(score ~ group, data = df2, model = "anova")
print(result2$tables)

# Logit example
df3 <- data.frame(y = rbinom(100, 1, 0.5), x = rnorm(100))
result3 <- paper_engine(y ~ x, data = df3, model = "logit")
print(result3$tables)
```

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plot_engine *Generate Publication-Ready Plots for Basic Models*

Description

Produces minimalist APA-style plots from a `basic_model` object returned by `paper_engine`. The plot type is selected automatically based on the estimation method: a forest plot of coefficients with 95% CI for OLS, a group means plot with 95% CI error bars for ANOVA, and a logistic probability curve for logistic regression.

Usage

```
plot_engine(model_object, y_label = NULL, x_label = NULL)
```

Arguments

`model_object`	An object of class `basic_model` generated by `paper_engine`.
`y_label`	A character string for the Y-axis label. If `NULL` (default), a label is generated automatically from the model type.
`x_label`	A character string for the X-axis label. If `NULL` (default), a label is generated automatically from the model type.

Value

A base R plot rendered in the active graphics device. The function is called for its side effect (the plot) and returns `NULL` invisibly.

Examples

```
set.seed(42)
df <- data.frame(y = rnorm(100), x1 = rnorm(100), x2 = rnorm(100))
result <- paper_engine(y ~ x1 + x2, data = df, model = "ols")
plot_engine(result, y_label = "Outcome", x_label = "Predictors")
```

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