

Package ‘ztils’

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Type Package

Title Various Common Statistical Utilities

Version 1.0.0

Description Utilities for simplifying common statistical operations including probability density functions, cumulative distribution functions, Kolmogorov-Smirnov tests, principal component analysis plots, and prediction plots.

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URL <https://zachpeagler.github.io/ztils/>,
<https://github.com/zachpeagler/ztils>

BugReports <https://github.com/zachpeagler/ztils/issues>

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glm_pseudor2	<i>glm_pseudoR2</i>
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Description

A function for calculating the pseudo R^2 of a glm object

Usage

```
glm_pseudor2(mod)
```

Arguments

mod The model for which to calculate the pseudo R^2

Value

The pseudo R^2 value of the model

Examples

```
gmod <- glm(Sepal.Length ~ Petal.Length + Species, data = iris)
glm_pseudor2(gmod)
```

multicdf_cont	<i>Multiple Cumulative Distribution Functions for Continuous Variables</i>
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Description

This function gets the cumulative distribution function for selected distributions against a continuous, non-negative input variable. Possible distributions include "normal", "lognormal", "gamma", "exponential", "cauchy", "t", "weibull", "logistic", and "all".

Usage

```
multicdf_cont(var, seq_length = 50, distributions = "all")
```

Arguments

var The variable of which to get the CDF
 seq_length The length of sequence to fit the distribution to
 distributions The distributions to fit x against

Value

A dataframe with x, the real density, and the pdf of the desired distributions with length (nrows) equal to seq_length + 1.

Examples

```
multicdf_cont(iris$Petal.Length)

multicdf_cont(iris$Sepal.Length,
              100,
              c("normal", "lognormal")
              )
```

multicdf_plot *multicdf_plot*

Description

This function extends 'multiCDF_cont' and gets the cumulative distribution functions (CDFs) for selected distributions against a continuous variable. Possible distributions include any combination of "normal", "lognormal", "gamma", "exponential", and "all" (which just uses all of the prior distributions). It then plots this using 'ggplot2' and a 'scico' palette, using var_name for the plot labeling, if specified. If not specified, it will use var instead.

Usage

```
multicdf_plot(
  var,
  seq_length = 50,
  distributions = "all",
  palette = "oslo",
  var_name = NULL
)
```

Arguments

var The variable to for which to plot CDFs
 seq_length The number of points over which to fit x
 distributions The distributions to fit x against
 palette The color palette to use on the graph
 var_name The variable name to use for x

Value

A plot showing the CDF of the selected variable against the selected distributions over the selected sequence length

Examples

```
multicdf_plot(iris$Sepal.Length)

multicdf_plot(iris$Sepal.Length,
              seq_length = 100,
              distributions = c("normal", "lognormal", "gamma"),
              palette = "bilbao",
              var_name = "Sepal Length (cm)"
            )
```

multiks_cont

Multiple Kolmogorov-Smirnov Tests for Continuous Variables

Description

This function gets the distance and p-value from a Kolmogorov-smirnov test for selected distributions against a continuous input variable. Possible distributions include "normal", "lognormal", "gamma", "exponential", and "all".

Usage

```
multiks_cont(var, distributions = "all")
```

Arguments

`var` The variable to perform ks tests against
`distributions` The distributions to test x against

Value

A dataframe with the distance and p value for each performed ks test

Examples

```
multiks_cont(iris$Sepal.Length)

multiks_cont(iris$Sepal.Length, c("normal", "lognormal"))
```

multipdf_cont	<i>Multiple Proportional Density Functions for Continuous Variables</i>
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Description

This function gets the proportional density functions for selected distributions against continuous, non-negative numbers. Possible distributions include "normal", "lognormal", "gamma", "exponential", and "all".

Usage

```
multipdf_cont(var, seq_length = 50, distributions = "all")
```

Arguments

var	The variable of which to get the PDF.
seq_length	The length of sequence to fit the distribution to
distributions	The distributions to fit x against

Value

A dataframe with x, the real density, and the pdf of the desired distributions with length (nrows) equal to seq_length + 1.

Examples

```
multipdf_cont(iris$Petal.Length)
multipdf_cont(iris$Sepal.Length, 100, c("normal", "lognormal"))
```

multipdf_plot	<i>multipdf_plot</i>
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Description

This function extends 'multiPDF_cont' and gets the probability density functions (PDFs) for selected distributions against continuous variables. Possible distributions include any combination of "normal", "lognormal", "gamma", "exponential", and "all" (which just uses all of the prior distributions). It then plots this using 'ggplot2' and a 'scico' palette, using var_name for the plot labeling, if specified. If not specified, it will use var instead.

Usage

```

multipdf_plot(
  var,
  seq_length = 50,
  distributions = "all",
  palette = "oslo",
  var_name = NULL
)

```

Arguments

var	The variable to for which to plot PDFs
seq_length	The number of points over which to fit x
distributions	The distributions to fit x against
palette	The color palette to use on the graph
var_name	The variable name to use for x. If no name is provided, the function will grab the column name provided in x

Value

A plot showing the PDF of the selected variable against the selected distributions over the selected sequence length

Examples

```

multipdf_plot(iris$Sepal.Length)

multipdf_plot(iris$Sepal.Length,
  seq_length = 100,
  distributions = c("normal", "lognormal", "gamma"),
  palette = "bilbao",
  var_name = "Sepal Length (cm)"
)

```

no_extremes

No extremes

Description

This function returns a dataframe subsetted to not include observations that are beyond the extremes of the specified variable. Extremes are defined by the quantiles ± 3 times the interquartile range.

Usage

```
no_extremes(data, var)
```

Arguments

data The data to subset
var The variable to subset by.

Value

A dataframe without entries containing extremes in the selected variable.

Examples

```
no_extremes(iris, Sepal.Length)
```

no_outliers	<i>No outliers</i>
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Description

This function returns a dataframe subsetted to not include observations that are beyond the outliers of the specified variable. Outliers are defined by the quantiles ± 1.5 times the interquartile range.

Usage

```
no_outliers(data, var)
```

Arguments

data The data to subset
var The variable to subset by

Value

A dataframe without entries containing outliers in the selected variable.

Examples

```
no_outliers(iris, Sepal.Length)
```

pca_data *Principal Component Analysis Data*

Description

This function uses a dataframe, PCA variables, and a scaled boolean to generate a dataframe with principal components as columns.

Usage

```
pca_data(data, pcavars, scaled = FALSE)
```

Arguments

data	The dataframe to add principal components to.
pcavars	The variables to include in the principle component analysis
scaled	A boolean (TRUE or FALSE) indicating if the pcavars are already scaled

Value

A plot showing PC1 on the x axis, PC2 on the y axis, colored by group, with vectors and labels showing the individual pca variables.

Examples

```
pca_data(iris, iris[,c(1:4)], FALSE)
```

pca_plot *Principal Component Analysis Plot*

Description

This function uses a group, PCA variables, and a scaled boolean to generate a biplot.using 'ggplot2' and 'scico'.

Usage

```
pca_plot(group, pcavars, scaled = FALSE, palette = "oslo")
```

Arguments

group	The group variable (column)
pcavars	The variables to include in the principle component analysis
scaled	A boolean (TRUE or FALSE) indicating if the pcavars are already scaled
palette	A color palette to use on the plot, with each group assigned to a color.

Value

A plot showing PC1 on the x axis, PC2 on the y axis, colored by group, with vectors and labels showing the individual pca variables.

Examples

```
pca_plot(iris$Species, iris[,c(1:4)])

pca_plot(iris$Species, iris[,c(1:4)], FALSE, "bilbao")
```

predict_plot	<i>Prediction Plot</i>
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Description

This function uses a model, dataframe, and supplied predictor, response, and group variables to make predictions based off the model over a user-defined length with options to predict over the confidence or prediction interval and to apply a mathematical correction. It then graphs both the real data and the specified interval using 'ggplot2'. You can also choose the color palette from 'scico' palettes.

Usage

```
predict_plot(
  mod,
  data,
  rvar,
  pvar,
  group = NULL,
  length = 50,
  interval = "confidence",
  correction = "normal",
  palette = "oslo"
)
```

Arguments

mod	the model used for predictions
data	the data used to render the "real" points on the graph and for aggregating groups to determine prediction limits (should be the same as the data used in the model)
rvar	the response variable (y variable / variable the model is predicting)
pvar	the predictor variable (x variable / variable the model will predict against)
group	the group; should be a factor; one response curve will be made for each group
length	the length of the variable over which to predict (higher = more resolution, essentially)

interval	the type of interval to predict ("confidence" or "prediction")
correction	the type of correction to apply to the prediction ("normal", "exponential", or "logit")
palette	the color palette used to color the graph, with each group corresponding to a color

Value

A plot showing the real data and the model's predicted 95% CI or PI over a number of groups, with optional corrections.

Examples

```
## Example 1
mod1 <- lm(Sepal.Length ~ Petal.Length + Species, data = iris)
predict_plot(mod1, iris, Sepal.Length, Petal.Length, Species)
```

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