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Type Package

Title Package of the German Book ``Statistik mit R und RStudio" by
Joerg grosse Schlarmann

Description All datasets and functions used in the german book
``Statistik mit R und RStudio" by grosse Schlarmann (2010-2024)
<<https://www.produnis.de/R/>>.

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compare.lm	<i>Compare Linear Models</i>
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Description

This function fits and compares several models (linear, quadratic, cubic, exponential, logarithmic, sigmoidal, power, logistic) to a given set of dependent and independent variables. It returns either a summary of the models with their R-squared values or predicted values based on the models.

Usage

```
compare.lm(dep, ind, predict = FALSE, steps = 0.01)
```

Arguments

dep	A numeric vector representing the dependent variable.
ind	A numeric vector representing the independent variable.
predict	Logical. If TRUE, the function returns predicted values for each model. Defaults to FALSE.
steps	Numeric. The step size for generating x-values for predictions. Only used if predict is TRUE. Defaults to 0.01.

Value

A data frame. If predict is FALSE, returns a data frame with the R-squared values for each model. If predict is TRUE, returns a data frame with the original data and predicted values for each model.

Examples

```
x <- c(6, 9, 12, 14, 30, 35, 40, 47, 51, 55, 60)
y <- c(14, 28, 50, 70, 89, 94, 90, 75, 59, 44, 27)
compare.lm(y, x)
compare.lm(y, x, predict=TRUE)
```

epa

Datatable of the epa Example

Description

Datatable of the epa Example

Usage

```
data(epa)
```

Format

A data frame with 620 observations in 6 variables

Details

Variables in the dataset:

- sex. a factor with levels m w d, giving the proband's sex
- age. a numeric vector
- cms. a numeric vector
- risk. a dichotome vector, 0 = not at risk, 1 = at risk
- expert. a dichotome vector of expert's decision, 0 = not at risk, 1 = at risk
- decu. a dichotome vector, 0 = no decubitus, 1 = decubitus

Source

<https://www.produnis.de/R/>

Faktorenbogen

Datatable of the Faktorenbogen Example for factor analysis

Description

Datatable of the Faktorenbogen Example for factor analysis

Usage

```
data(Faktorenbogen)
```

Format

A data frame with 150 observations in 14 variables

Details

Variables in the dataset:

- gender. a factor with levels female male other, giving the proband's gender
- age. a numeric vector of proband's age in years
- A. Item A of the questionnaire, numeric
- B. Item B of the questionnaire, numeric
- C. Item C of the questionnaire, numeric
- D. Item D of the questionnaire, numeric
- E. Item E of the questionnaire, numeric
- F. Item F of the questionnaire, numeric
- G. Item G of the questionnaire, numeric
- H. Item H of the questionnaire, numeric
- I. Item I of the questionnaire, numeric
- J. Item J of the questionnaire, numeric
- K. Item K of the questionnaire, numeric
- L. Item L of the questionnaire, numeric

Source

<https://www.produnis.de/R/>

freqTable	<i>create a frequency table</i>
-----------	---------------------------------

Description

returns a frequency table with absolute and relative frequencies and cumulated frequencies

Usage

```
freqTable(werte)
```

Arguments

werte factor with observed data

Value

dataframe table

Examples

```
x <- ceiling(stats::rnorm(20))
freqTable(x)
```

kenngroessen	<i>create a tibble with kenngroessen</i>
--------------	--

Description

returns a tibble with all kenngroessen

Usage

```
kenngroessen(werte)
```

Arguments

werte numeric vector

Value

tibble with all kenngroessen

Examples

```
x <- ceiling(stats::rnorm(20))
kenngroessen(x)
```

KIbinomial_a	<i>compute confidence intervall for binomial proportions</i>
--------------	--

Description

returns borders and length of confidence intervall for binomial proportions

Usage

```
KIbinomial_a(p, n, alpha)
```

Arguments

p	proportion obeserved
n	number of observations
alpha	error niveau

Value

confidence intervall

Examples

```
KIbinomial_a(0.35, 150, 0.05)
```

KIbinomial_u	<i>compute confidence intervall for difference of binomial proportions</i>
--------------	--

Description

returns borders and length of confidence intervall for difference of binomial proportions

Usage

```
KIbinomial_u(p1, n1, p2, n2, alpha)
```

Arguments

p1	proportion obeserved in group 1
n1	number of observations in group 1
p2	proportion obeserved in group 2
n2	number of observations in group 2
alpha	error niveau

Value

confidence intervall

Examples

```
KIbinomial_u(0.25, 100, 0.4, 150, 0.05)
```

KInormal_a	<i>compute confidence intervall for mean of normal distributed data</i>
------------	---

Description

returns borders and length of confidence intervall for mean of normal distributed data

Usage

```
KInormal_a(xquer, s, n, alpha)
```

Arguments

xquer	mean of obeserved data
s	standard deviation of observed data
n	number of observations
alpha	error niveau

Value

confidence intervall

Examples

```
KInormal_a(400, 20, 100, 0.05)
```

KInormal_u	<i>compute confidence intervall for mean of normal distributed data</i>
------------	---

Description

returns a data.frame with borders and length of confidence intervall for mean of normal distributed data

Usage

```
KInormal_u(x1, s1, n1, x2, s2, n2, alpha)
```

Arguments

x1	mean of obeserved data in group 1
s1	standard deviation of observed data in group 1
n1	number of observations in group 1
x2	mean of obeserved data in group 2
s2	standard deviation of observed data in group 2
n2	number of observations in group 2
alpha	error niveau

Value

data.frame of confidence intervall

Examples

```
KInormal_u(2.22, 0.255, 13, 2.7, 0.306, 10, 0.05)
```

lon.lat.osm	<i>get longitude and altitude from an address using OpenStreetMap's API at http://nominatim.openstreetmap.org</i>
-------------	--

Description

get longitude and altitude from an address using OpenStreetMap's API at <http://nominatim.openstreetmap.org>

Usage

```
lon.lat.osm(address = NULL)
```


Arguments

address a character of an address

Value

a data.frame containig "address", "lon", "lat"

Examples

```
lon.lat.osm("Eiffeltower")
```

MarioANOVA

Datatable of the SuperMario Example for Friedman-ANOVA

Description

Datatable of the SuperMario Example for Friedman-ANOVA

Usage

```
data(MarioANOVA)
```

Format

A data frame with 47 observations in 8 variables

Details

Variables in the dataset:

- Name. The characters' name
- Alter. The characters' age in years
- Kingdom. The characters' home
- Geschlecht. The characters' gender (männlich = male, weiblich = female)
- BadGuy. Whether the character is a bad guy, logical
- t1. Measure at time 1
- t2. Measure at time 2
- t3. Measure at time 3

Source

<https://www.produnis.de/R/>

Messwiederholung

Datatable of the Messwiederholung Example for ANOVA

Description

Datatable of the Messwiederholung Example for ANOVA

Usage

```
data(Messwiederholung)
```

Format

A data frame with 200 observations in 4 variables

Details

Variables in the dataset:

- Name. The first name of the probands.
- t1. Measure at time 1
- t2. Measure at time 2
- t3. Measure at time 3

Source

<https://www.produnis.de/R/>

mma

Dataset of a work sampling study

Description

Dataset of a work sampling study

Usage

```
data(mma)
```

Format

A data frame with 9768 observations in 6 variables.

Details

Variables in the dataset:

- day. a vector, giving the number of the observation day
- time. a factor giving the time of observation
- ward. a factor giving the ward under observation
- qual. a factor giving the qualification of the nurse
- category. a factor of qualification categories
- action. a factor giving the observed action

Source

<https://www.produnis.de/R/>

Nachtwachen

Dataset of the German Nachtwachen study

Description

Dataset of the German Nachtwachen study

Usage

`data(Nachtwachen)`

Format

A data frame with 276 observations in 37 variables.

Source

<https://www.produnis.de/R/>

nw

Dataset of the German Nachtwachen study with labelled variables

Description

Dataset of the German Nachtwachen study, labelled version

Usage

```
data(nw)
```

Format

A data frame with 276 observations in 37 variables.

Source

<https://www.produnis.de/R/>

OrdinalSample

Datatable of an Ordinal Sample

Description

Datatable of an Ordinal Sample

Usage

```
data(OrdinalSample)
```

Format

A data frame with 415 observations in 4 variables.

Details

Variables in the dataset:

- *Konflikt*. a numeric vector giving the potential of conflicts.
- *Zufriedenh*. a numeric vector giving the satisfaction of workers
- *Geschlecht*. a factor of proband's sex, 1 = male, 2=female
- *Stimmung*. an ordinal factor of proband's mood

Source

<https://www.produnis.de/R/>

pairwise.chisq.test *Pairwise Chi-Square Tests*

Description

This function performs pairwise Chi-Square tests for two factors.

Usage

```
pairwise.chisq.test(A, B, p.adjust.method = "bonferroni")
```

Arguments

A A factor with two or more levels. The first variable.
B A factor with two or more levels. The second variable.
p.adjust.method A string specifying the method for adjusting p-values. Default is "bonferroni".

Details

This function creates all possible pairs of levels of factor B and performs a Chi-Square test for each pair of B on variable A. The p-values are adjusted according to the specified method. #' This function is created for educational purposes only. For exact p-values, consider using `reporttools::pairwise.fisher.test()`.

Value

A data frame with the results of the pairwise Chi-Square tests. Includes the groups, Chi-Square statistic, degrees of freedom, p-values, adjusted p-values, and significance stars.

Examples

```
set.seed(123)
A <- factor(sample(c("Male", "Female"), 100, replace = TRUE))
B <- factor(sample(c("Location1", "Location2", "Location3"), 100, replace = TRUE))
pairwise.chisq.test(A, B, "holm")
```

pf8 *Dataset of the PF8 example.*

Description

This is the dataset of the PF8 example.

Usage

```
data(pf8)
```

Format

A data frame with 731 observations in 16 variables.

Source

<https://www.produnis.de/R/>

Pflegeberufe

Matrix of Pflegeberufe by Isfort et al. 2018

Description

Matrix of Pflegeberufe by Isfort et al. 2018

Usage

```
data(Pflegeberufe)
```

Format

A matrix with 9 cols (years) and 5 rows (nursing profession).

Author(s)

Isfort et al. 2018 (Pflegethermometer)

Source

<https://www.produnis.de/R/>

sens.spec

compute sensitivity and specificity

Description

returns sensitivity specificity, negativ-predictive-value, positiv-predictive-value

Usage

```
sens.spec(rp, rn, fp, fn)
```

Arguments

rp	number of true-positive (richtig-positiv)
rn	number of true-negative (richtig-negativ)
fp	number of false-positive (falsch-positiv)
fn	number of false-negative (falsch-negativ)

Value

a data.frame with sens, spec, ppw, npw

Examples

```
sens.spec(40, 17, 85, 4)
```

ztrans	<i>z-Transformation by given numbers, with $z = (x - \mu) / sd$</i>
--------	--

Description

z-Transformation by given numbers, with $z = (x - \mu) / sd$

Usage

```
ztrans(x, mu = 0, sd = 1)
```

Arguments

x	a value to transform
mu	the given mu
sd	the given standard deviation

Value

the z-transformed value

Examples

```
ztrans(120, mu=118, sd=20)
```

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